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LONDON, W.C.

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1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

$$f(x) = \int_0^x \frac{1}{1+t^2} dt, \quad (1)$$

where x is a real number. It is shown that the function $f(x)$ is increasing and concave down on the interval $(-\infty, \infty)$. Moreover, it is proved that the function $f(x)$ has a horizontal asymptote at $y = \frac{\pi}{2}$ as $x \rightarrow \infty$ and $y = -\frac{\pi}{2}$ as $x \rightarrow -\infty$.

2. In the second part of the paper, we consider the function $g(x)$ defined by the equation

$$g(x) = \int_0^x \frac{t}{1+t^2} dt, \quad (2)$$

where x is a real number. It is shown that the function $g(x)$ is an odd function, i.e., $g(-x) = -g(x)$. Moreover, it is proved that the function $g(x)$ has a horizontal asymptote at $y = \frac{\pi}{2}$ as $x \rightarrow \infty$ and $y = -\frac{\pi}{2}$ as $x \rightarrow -\infty$.

3. In the third part of the paper, we consider the function $h(x)$ defined by the equation

$$h(x) = \int_0^x \frac{1}{1+t^4} dt, \quad (3)$$

where x is a real number. It is shown that the function $h(x)$ is increasing and concave down on the interval $(-\infty, \infty)$. Moreover, it is proved that the function $h(x)$ has a horizontal asymptote at $y = \frac{\pi}{2\sqrt{2}}$ as $x \rightarrow \infty$ and $y = -\frac{\pi}{2\sqrt{2}}$ as $x \rightarrow -\infty$.

4. In the fourth part of the paper, we consider the function $k(x)$ defined by the equation

$$k(x) = \int_0^x \frac{t^2}{1+t^4} dt, \quad (4)$$

where x is a real number. It is shown that the function $k(x)$ is an even function, i.e., $k(-x) = k(x)$. Moreover, it is proved that the function $k(x)$ has a horizontal asymptote at $y = \frac{\pi}{4\sqrt{2}}$ as $x \rightarrow \infty$ and $y = \frac{\pi}{4\sqrt{2}}$ as $x \rightarrow -\infty$.

5. In the fifth part of the paper, we consider the function $l(x)$ defined by the equation

$$l(x) = \int_0^x \frac{1}{1+t^6} dt, \quad (5)$$

where x is a real number. It is shown that the function $l(x)$ is increasing and concave down on the interval $(-\infty, \infty)$. Moreover, it is proved that the function $l(x)$ has a horizontal asymptote at $y = \frac{\pi}{2\sqrt{3}}$ as $x \rightarrow \infty$ and $y = -\frac{\pi}{2\sqrt{3}}$ as $x \rightarrow -\infty$.

6. In the sixth part of the paper, we consider the function $m(x)$ defined by the equation

$$m(x) = \int_0^x \frac{t^3}{1+t^6} dt, \quad (6)$$

where x is a real number. It is shown that the function $m(x)$ is an odd function, i.e., $m(-x) = -m(x)$. Moreover, it is proved that the function $m(x)$ has a horizontal asymptote at $y = \frac{\pi}{4\sqrt{3}}$ as $x \rightarrow \infty$ and $y = -\frac{\pi}{4\sqrt{3}}$ as $x \rightarrow -\infty$.

THE
AMATEUR GARDENER'S
CALENDAR.



Round the great dial of the year
 The Seasons went, and struck the quarters,
 Whilst the swift Months, like circulating hours,
 Told the twelve changes by their changing flowers.

THE

AMATEUR GARDENERS CALENDAR

1896

A MONTHLY

FOR THE GARDENERS OF THE AMATEUR GARDENERS' ASSOCIATION
OF THE UNITED STATES OF AMERICA

MRS. J. H. HARRIS

Editor

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M. H. HARRIS

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THE
AMATEUR GARDENER'S
CALENDAR.

BEING

A Monthly Guide

AS TO WHAT SHOULD BE AVOIDED, AS WELL AS WHAT SHOULD BE DONE,
IN A GARDEN IN EACH MONTH :

BY

MRS. LOUDON,

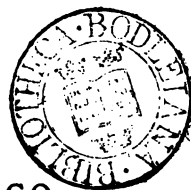
AUTHOR OF "THE LADY'S COUNTRY COMPANION," &c. &c.

REVISED AND EDITED BY

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AUTHOR OF "THE PARKS, PROMENADES, AND GARDENS OF PARIS."

WITH NUMEROUS ILLUSTRATIONS.



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THE
AMATEUR GARDENER'S
CALENDAR.

INTRODUCTION.

It is long since Evelyn wrote that "the life and felicity of an excellent gardener are to be preferred before all other diversions," and increasing years prove that the opinion is endorsed by the great majority of those who can afford the pleasures of amateur gardening. Vast has been the increase of the class who, by wholesome exercise in the garden, add zest to its joys—who raise and cultivate their own flowers, plant and prune their own trees, and find as high a pleasure in the effort as in the result. Numbers who manage their own gardens are those whose chief energies have been, or are being, put forth in entirely different fields. To such, gardening is usually a recreation after the toils of the day, or in the evening of life, and, as they are frequently without practical experience, a simple and handy guide to the various every-day operations is often a great help, and even a necessity to success. *The Amateur Gardener's Calendar* was written to meet this want, and the present edition is issued with a view of bringing Mrs. Loudon's useful work within the reach of a far wider class, the alterations being such as, without changing the plan of the book, it is hoped bring it down to the wants of the present day.

The directions given are chiefly adapted to the climate of the neighbourhood of London, but they are almost equally applicable in all other parts of the country, except of course at elevations where gardening is rarely and with difficulty practised. It is not

the difference of position in the gardens of these small islands that renders it desirable not to follow literally any calendar of garden operations, but the differences in our seasons. A book directing the various operations of the garden could be followed with almost mathematical exactness were our seasons equable; but no book ever written, or that ever can be written, will save the amateur from the necessity of exercising his judgment, so as to adapt his garden operations to the weather and the state of the soil. It should be indelibly fixed on the amateur's mind that to perform any operation when the state of the ground or the weather is not suited for it, is not only unwise from the mere point of view of convenience, but that frequently crops are lost and plants destroyed by it. Half the secret of successful gardening depends on suiting our efforts to our changeable climate. To plant, and dig, and trench, when the ground is in proper condition; to sow the seed when the earth is in a warm, open, and fertile state; to duly gather the various items of the long-continued harvest of the garden, and above all to calculate beforehand on every kind of work that may be executed indoors when the weather is not favourable for the more important garden operations out of doors, is to master half the secrets of the art of an "excellent gardener."

JANUARY.

General Observations and Directions.

The Weather, &c.—At the beginning of this month the ground is frequently hard with frost ; but after the first fortnight, a change takes place, and generally either snow or rain falls ; or, after a few days of open weather, the frost sets in more intensely than before. It is, indeed, from this being so often the case, that there is a proverb in many parts of England, implying that the 14th of January is always either the coldest or the wettest day in the year.

Though some kind of vegetation has been found growing wild in the warmest and coldest climates in the world, yet the greater number of plants can only bear a temperature ranging from 32° to 90° Fahr. Above that heat many become what gardeners call scorched or burnt, and below it frozen. Every one, however, knows that frost acts differently on different plants, and that it even acts differently on the same plants under different circumstances.

Plants are always more injured by frost of every kind, in a growing state, than in a state of repose, as the growing plant abounds with sap, and this, when frozen, naturally bursts the veins that contained it, if they are sufficiently firm to offer resistance. Thus ligneous plants that have been killed by frost frequently present a singular appearance of laceration, and the outer skin or bark is torn into shreds ; just as a glass bottle containing water is shivered into atoms by the sudden expansion of the fluid when the water freezes. A frost accompanied by a sharp north wind is generally either quite fatal to half hardy plants in a growing state, or it kills them to the ground : but if the plants are in a state of repose, a dry frost appears only to wither them, and they recover their vigour after a thaw. The injurious effects produced by frost on plants are also much greater after a

cold wet summer than after a hot dry one, as in the latter case the sap is much thicker than in the former, and the difficulty of freezing fluids is always in proportion to their density. Plants which have grown very luxuriantly by being planted in a rich soil, and those which abound in a thin watery sap, are also more likely to be killed by frost, than others that are of a drier nature, or those that have made little growth in poor soil, or those that have had their shoots well ripened before the arrival of winter.

Frost, being occasioned by the coldness of the atmosphere, first affects the surface of both earth and water; and, as is well known, the longer a frost continues, the thicker the ice becomes on ponds, so in the like manner in a slight frost only the surface of the ground is frozen, but the frost penetrates deeper and deeper, according to the time it continues, till it reaches the depth of from six to ten inches or a foot, which is the maximum effect of cold in Great Britain. It may be useful to observe that the ordinary warmth of the earth below the part affected by atmospheric changes is from 48° to 58° Fahr.; and that both in summer and winter it is very nearly the same. When the ground is covered with snow, the plants are kept warm; because the light spongy nature of the snow renders it a bad conductor of heat, and prevents the earth from being chilled by the coldness of the atmosphere. Thus, while snow is upon the ground, the plants covered with it are quite safe from frost. Snow is, however, injurious to trees and shrubs from the danger that exists of its breaking their branches by its weight: and hence, after a heavy fall of snow, gardeners generally go round their shrubberies and shake the snow off their trees and shrubs. A heavy fall of moist snow has been known to do as much damage as the most severe frosts, by breaking off the finest limbs of large specimen evergreens and conifers.

When the snow begins to melt, channels should be cut to let the snow water run off quickly; as nothing can be imagined more bhilling to plants than melted snow. The reason is, that the snow parts with its cold in melting, and consequently the water that flows from it is colder than the snow itself. It is on this account that confectioners, when they want to freeze ice creams, &c., always mix salt with their ice, as the salt dissolves the ice, and makes it part with its cold; and it is on this account also that sleet, which is snow melted as it falls, always feels colder than snow itself.

A very wet season is almost as injurious to plants as a hard frost ; as wet rots those tender parts of the root through which the plant principally takes its food ; and if the season should not be so wet as actually to destroy the roots, it is always very injurious to plants in winter, as it keeps them in a growing state till late in the year, and thus renders them more liable to be injured by frost.

The Open Garden.—If the ground be not frozen and not saturated with wet, the planting of fruit trees may be proceeded with ; but if possible it should not be attempted when such is not the case. Where the buds of small trees suffer from birds it will be wise to defer their pruning for a time ; generally, however, gardeners prune them in the autumn. Where the gooseberry bushes are much infested by the caterpillar it is a good plan to remove a few inches of soil around their stems and underneath the bushes, and replace it by fresh earth. It would act as an additional safeguard if some quicklime were thrown around their stems previous to replacing with the fresh earth. If an opportunity occurs of taking this inch or two of surface earth when the ground is frozen to that depth, it need hardly be said that it could be done then more effectually. It is desirable to see that all newly-planted trees are secured from injury by high winds—in other words, to see that they are well staked, and the surface of the ground over their roots should be mulched, *i.e.*, covered to the depth of an inch or two with rather short and half-decomposed stable manure. On all fine days the nailing and training of fruit and other trees may be proceeded with ; but it is a mistake to attempt this kind of work in cold weather, when a man's fingers can hardly hold a nail, and when it is impossible for an average amount of work to be done in this way. It is cruelty to animals to keep men shivering at any work at which they cannot exert themselves on a cold day. The labours should be suited to the time and temperature, and by a little judgment in this way much more work will be performed, and a real kindness done to the worker. Men are often employed at nailing and training when their hands and feet are benumbed, and when they have to cease every five minutes to try by clapping and stamping to keep the blood in circulation, though they might at the same time be comfortably employed at active work. Where the workman has the matter in his own hands this kind of thing is not likely to occur, as it occasionally does where several are employed under ignorant or unfeeling supervision. The adoption of a better system of wiring walls will ere long put an

end to much of the troublesome nailing that now obtains. New nails ought to be put in boiling linseed oil before being used ; it will prevent them from rusting. Old ones too will be the better for a dip in oil after having been heated to a red heat.

Do not attempt the pruning of trees when the branches are frozen. The limbs of old trees that it is intended to graft, had better be cut back now than left till the sap begins to move. Cut off grafts, especially those of the plum and cherry, for if these are not taken off early, they seldom succeed well. After the grafts are cut off, put them half way into the ground in some sheltered spot, where neither the sun's rays nor drying winds will affect them till the grafting season arrives. Cuttings may now be made of such currants and gooseberries as we desire to propagate. They should be from nine to twelve inches in length, and all the eyes should be picked out except the three at the top.

As most people who do their garden work in good season will have all or nearly all the routine work done by this time, this month is perhaps the most convenient during the whole year for the preparation of soils, manures, and composts. Every good garden should have a special spot for these in some obscure but convenient corner, and they should be kept in good order at all times, and at this season thoroughly turned over, replenished, and tidied up. When the ground is hard from frost is the best time for turning over compost heaps. One of the greatest differences, although it is one not often noticed, between the well and the badly managed garden, consists in this very matter of composts. In a good garden the soils and manures are so arranged that when any particular kind of potting is to be done the operator has merely to have his soil brought to the spot ready ; whereas, on the other hand, we frequently see amateurs who wish to pot or plant a specimen having first to prepare the soil. For a solitary plant, peat and loam, and perhaps several other things, have to be sought for, and, it may be, chopped and prepared, so that in the end about ten times as much time is lost as if a good preparation were made right off. There should be a goodly ridge of loam, one of peat, one of well-decomposed stable manure, a smaller one of cow ditto, one of leaf mould, one of fine sharp sand, one of common loam, and finally, a heap of mixture to suit for the potting of all ordinary garden plants—say a mixture of the top spit of good pasture loam ameliorated with rotten manure, sharp sand, and leaf mould. Some of this placed in a heap in a shed, so as to be ready

for potting at all times, will suit nine out of ten ordinary pot plants, and much time will be saved thereby.

All good gardeners have most of their rough winter work done by this time, but if not, it need hardly be said that no opportunity should be lost to forward it. Ground may also be got ready for the earlier crops of peas and other vegetables. If the sowing of the earliest kinds of peas and beans (Sutton's Ringleader pea and early Mazagan bean) be not already made, they should be so at once in a favourable situation, or at least as soon as the ground is in good working order. For these and all sowings at this early season the driest ground and most favourable spots in the garden should be selected. The things that may be thus sown are some very early kind of potato, a little horn carrot, turnips (early Dutch or strap-leaf), a little silver-skinned onion for salading, parsley, and radishes. But such sowings must not be attempted unless the ground is free from frost and in what gardeners call a "nice state." Such rough things as Jerusalem artichokes and horseradish may be transplanted at any time. A great deal of trenching is often done in frosty weather, but it is not well to do so while the ground is frozen deep, as by burying the deep frozen clods we simply preserve the ground in a cold and sloppy state, long after such conditions depart from the surface, and that is by no means desirable in a garden where we should profitably employ every inch of ground in spring. Broccoli fit for use or nearly fit may be taken up and placed in a cellar or shed, and if the weather is likely to be severe it would be wise to take up those with even the heart just beginning to form, and place them, closely planted in sand or any convenient compost, in rough frames, or any place where they will be free from frost. Now is about the time to think of making the first hotbed for the raising of melons, cucumbers, stove and greenhouse seedlings, and choice seeds generally; it will also prove highly useful for propagating from cuttings.

Indoor Department.—In gardens where forcing is carried on, there is now plenty to do, starting the early vines, peaches, &c. It is also a good time to prepare a pit or snug frame for a very early crop of potatoes. Fill a pit to very near the surface with a gentle heating body of leaves, surface it with nice free loam, and be sure to give the plants as much air as may be possible without hurting them with cold, as upon this point much of the success depends. In the greenhouse, conservatory, and stove, climbers should be

pruned and tied in neatly and firmly, though not rigidly, to the surfaces they are to embellish; and all plants liable to bug, scale, or vermin of any kind, should be cleaned; the houses also cleaned in every crevice, so that we may begin the spring campaign as free from vermin as possible. To a great number of plants dirt means disease, and too much attention cannot be given to getting the houses and plants perfectly free from vermin while there is time to devote to it. Like weeds in a garden, vermin never show much if frequently extirpated when first seen, but once let them get ahead, and it is no easy task to get rid of them. Chrysanthemums, now turned out of the houses, should be planted out, if we wish to add to the stock in the open air, or if not, thrown away, reserving, however, a specimen of each, which will be quite sufficient to propagate a stock for next year's bloom. Those who care about the Barbe de Capucin of the French, may quickly obtain it by packing some chicory roots in sand in a cellar. Of course any other light and slightly moistened material will do as well, but the simplest way we know of is to tie the roots in little bundles, and plunge them to the crown in a heap or box of sand in a cellar, cave, or any other dark place. Of course in a garden where forcing is carried on, this may be more conveniently done in the place devoted to sea-kale and rhubarb forcing, which should be now going on. Introduce fresh supplies of rhubarb, seakale, &c., to the forcing-house, and make another piece of mushroom-bed.

The fruit-room will now probably be much the better for being looked over, and all decayed fruit removed. Forcing should now be proceeding with regularity wherever it is carried on, and of course every lengthening day will give the plants fresh encouragement, so that hyacinths, narcissi, and all sorts of early flowers, will come on rapidly with little attention, beyond regulating the temperature. About 50° Fahr. at night, and from that to 60°, or a little higher, during the day, is a nice heat for plant forcing, and in the forcing-house the chief attraction of the garden will be found for some weeks. In forcing flowers do not forget the lily of the valley, the little white flowering Deutzia, the double variety of *Prunus sinensis*, which is such a charming snow-white, double-cherry-like flower. All sorts of frame or dry pit plants should receive abundance of air when the weather permits, and particularly on bright breezy days, to counteract the damp and sliminess which always accumulate in such places during winter. At this time, too, cover-

ing material to protect pits and frames from hard frost should be at hand and ready for use at a moment's notice. Mats are chiefly used, but in hard frost dry litter should be heaped on pretty thickly to keep the frost out of cold frames. All such structures require watching to counteract the effects of damp and frost, or the contents may suffer considerably, or "damp off" in a body. Do not, in case of very severe frost, uncover the frame every day, but leave the protection on, and if the hard frost should last more than a few days, roll down the covering at the top of the frame for a foot or two a little after breakfast, and cover up snugly before the sun goes down. Select and order your seeds as soon as convenient. Wherever there is anything like a forcing-pit or house at work, or an early vinery, kidney beans should be sown at this season, as they are so easily fruited on the front or back shelf, four or five plants in each eight-inch pot, or in rough narrow boxes. Start also a few of the early strawberries, first introducing them to a cool greenhouse temperature.

In the greenhouse or conservatory a rather low equable temperature should be maintained, and every effort made to add to its attractions just now when out-door flowers are past. The temperature should not get below 40°, except in very severe weather, when it might be allowed to fall a little lower, as it could scarcely be maintained so high without rendering the air of the house too parching. If late vines are not already pruned, do not delay the operation a moment.

Things not to be done in January.

Never under any circumstances give a plant in a pot a very little dose of water because the weather happens to be dull and the plant not thoroughly dry. The true rule for watering pot plants is to wait till they are really dry, really in want of it, and then give them a thorough dose, by filling up the pot to the brim, and repeating the operation when the first dose has sunk.

Never water a plant in a pot from the sides of which the earth has shrunk away, leaving a crack all round. The earth should be firmly pressed down with the thumb or with a blunt stick; that once done, the water will sink equally through the ball instead of

quickly passing down the sides, leaving the ball and most of the roots dry.

Never move soils or manure, or barrows or carts with any heavy load over the soft surface of a garden while you have an opportunity of doing it when the ground is frozen hard, as it may be done so much more easily in the latter case.

If careless enough to have deferred any nailing or other operations requiring the operator to stand almost perfectly still while executing them, never be guilty of the cruelty of making anybody do it in cold weather—do it yourself, if you like it. In doing such work in bitter weather men usually lose half their time in endeavouring to warm their fingers and toes.

Never leave newly-planted fruit trees, or indeed any trees or shrubs, except the smallest saplings of very common kinds, without having them properly staked, or the high winds may soon do them much damage.

Never allow plants or flowers that would serve to embellish the conservatory, or whatever answers for that structure, to bloom, or, as a rule, even to expand in the pits or other houses in which they may be growing. They should be placed in the show-house to open, as to many persons plants approaching the flowering stage are quite as interesting as when in bloom; besides, the practice tends to prolong the blooming period in the conservatory, and prevents the check and disfigurement that sometimes results from the removal of plants from one structure to another when in full bloom.

Never apply more fire-heat to structures containing what are generally known as hard-wooded plants than is necessary to completely exclude frost.

Never wait for the presence of more than half a dozen specimens of aphids to be assured that fumigation is required.

Never waste valuable space on the stages, pits, or benches of houses by keeping on them dormant fuchsias, bulbs, subtropical plants, &c., which will be quite as well stowed under the said benches or stages, or in any dark place perfectly free from frost.

Never expose vines on the outside of a vinery without fully protecting them. This practice is not so uncommon as may be supposed, and it is but a few years since I saw a number of vines killed from this cause. The house in which they grew was also used as a stove, and in order to prevent the vines being excited they were placed on the outside after being barked and dressed—they

escaped during several mild winters, but at last a severe frost came and they were killed to the stumps.

Never commence any forcing of fruits, or plants, or indeed any important phase of cultivation in a plant-house of any kind without having previously thoroughly cleansed every surface.

Never apply very cold water to tender plants in hotbeds or stoves: as a general rule the water ought to be of the same temperature as the mean of that in which the plants are growing.

In covering pits or frames never adopt the very common practice of covering with straw, hay, litter, and mats only, if a sufficiency of any kind of inexpensive waterproof to cover all can be obtained. Usually the litter, &c., employed for covering becomes saturated manure a few days after being used, and has to be often replaced during the winter. It is needless to add that wet litter on frames is much less effective in keeping out frost than that which is dry. Amateurs who usually have but a short length of pits or frames would always find it advantageous to have waterproof covers sufficient for it. Whatever covering is adopted it should be well fastened down.

Never expose tender plants that have been frozen to the action of the sun, as death is almost sure to result from it. Keep them shaded until they have gradually thawed.

Never build at this season if you can help it; as when mortar is exposed to the frost before it is dry, it crumbles and will not set; and in very wet weather, or after snow, when the ground is soft, the foundations of walls are apt to settle irregularly.

Avoid as far as possible digging when the soil is saturated with water.

Never plant at this season in clayey soils; as the water cannot pass freely away from the roots; and should the roots be either frozen or rotted, the plant will die. If obliged to plant, take care that the soil is well drained; that the collar of the plant, which is the part immediately above the roots, is kept above the surrounding earth, and the ground about the plant, as far as the roots extend, is mulched, that is, covered with straw or litter.

In plant-houses, never syringe the plants before fumigating them; and never open the lower sashes on the side from which the wind blows.

Never water plants (particularly those which are bulbous or

tuberous) during the season when they require to be kept in a state of repose. It is, however, necessary to bear in mind that some bulbs thrive perfectly without being dry at any time throughout the year. *Amaryllises* and *Vallota* for example.

Principal Operations in January.

Manuring is a part of gardening that is rarely properly understood; as many persons suppose it consists entirely in applying stable manure to the crops. The fact is, however, that manuring is merely the art of supplying qualities to the soil in which it is deficient, and that consequently any substance may occasionally serve as manure. Manures act in three ways: they stimulate the vital forces; they absorb nourishment for the plants from the atmosphere; or they supply them with food from the soil. Stable manure acts partly in stimulating the vital forces of plants by the heat it evolves while in a state of fermentation; and partly by supplying them with food. Carbon, oxygen, nitrogen, and hydrogen, with a small quantity of some kind of earthy matter, constitute the food of plants, and these substances are found not only in all vegetables, but in all animal matter. The proportions of these elementary substances are very different, as the quantity of carbon in every vegetable is equal to about one-half its weight, and the oxygen amounts to rather more than one-third; while the hydrogen is only equal to about five per cent., the nitrogen rarely exceeds two and a half or three per cent., and the quantity of earthy matters, though it differs considerably in different plants, is generally still smaller. It must be remarked, however, that though the elementary substances of the plants differ so much in quantity, they are all equally essential, and that the plant suffers exceedingly if any one of them is deficient.

As all vegetable and animal matters contain the same elements, it is clear that all such matters must make good manure; though it is equally clear that they must be decomposed, that is, separated into their original elements before they can be available as the food of plants. Stable manure, containing as it does both animal and vegetable matter, is admirably adapted for this purpose, when sufficiently decomposed to allow the plants, with the assistance of light and heat, to assimilate the elements of which it is composed; and

decayed vegetables are equally so, as of course they contain all the component parts required to form other vegetables. Both stable manure and vegetable refuse ferment when they are decaying; and as this fermentation generates heat, that heat—when it can be applied to plants—stimulates their vital action, so as to force them, in the absence of light, to form roots; and this is the use of hotbeds. As hotbeds are required to stimulate the plants grown in them by their heat, they should be made with manure that is only partially decomposed; but it will first require to be turned over to rid it of some of its caustic gases. Stable manure particularly contains a great deal of ammoniacal gas, which, though it is of the greatest value as a manure, is so highly stimulating as to become caustic if applied in large quantities; and hence it is dangerous to make stable manure into a hotbed till the heat produced by fermentation has begun to abate; as the gas first evolved would burn the plants, that is, would shrivel them up and destroy them, if it were permitted to come in contact with them.

The best possible course for the amateur gardener to pursue with regard to all artificial manures is to have nothing whatever to do with them. Guano and other manures may, of course, be used with a good result in gardens, but there is danger in their use, provided proper care is not taken, and it is unquestionable that a given sum spent in the addition of good soil or simple manures to a garden, produces a better result than the same amount spent in artificial manures. To purchase any of the artificial manures now made up in canisters, and sold at about the price of good coffee, is simply a quick means of wasting money that otherwise might go to the purchase of leaf-mould, good loam, stable or cow manure, and peat, which add directly and substantially to the fertility of a garden. No matter how difficult it may be to obtain soil or manure, the amateur should always prefer them. There may seem a difficulty in getting soil or manure in the neighbourhood of cities, but both are really much cheaper in these places than in the country. The numbers of horses cheapen the manure, and the repeated shifting of the ground in alterations, &c., makes it easy for those with their eyes open to secure soil. Much of the rubbish for which contractors are often glad to get a shoot, is excellent for gardening purposes, for the sub-soil, if not the upper crust. The road grit, which is gathered in such quantities, and which forms an excellent addition to garden soil, may be had for a mere trifle in

London, and probably in other large cities, in fact in many places they are glad to deposit it, if near where collected, for a merely nominal fee.

As for liquid manure, now so much used in garden practice, here again the simple materials are the best, and the diluted drainings of the manure heap, or liquid manure made from sheep's droppings, are as good as can be obtained. It is generally procured by throwing a lot of manure at the bottom of a small tank, sunken barrel, or similar article, and filling it with water. When made and settled it is fit for use for a little while, but then the supply falls towards the dregs at the bottom, and the dregs are accordingly fished up, and thus it is that the pots where liquid manure is used, are covered with a sediment alike nasty and detrimental to the health of the plants. This, and the fact that the tank requires to be cleaned out frequently, and the liquid waited for till it is settled, throw a few little awkwardnesses in the way of its use, which renders liquid manure an aid rarely resorted to even in many gardens which have much want of it. All this would be obviated by making a little tank in the following way. Let the tank be of slate—it is the best, most lasting, and neatest material—oblong in outline, and divided into two equal parts with a partition of slate also. Of course it may be made of other material, if you choose. The lower foot or so of this partition should be perforated with holes a few inches apart, and eighteen inches of rough gravel thrown in on one side. On that place an inch or two of fine gravel, and then the couple of barrowfuls of sheep's droppings, or whatever manure you may use, and finally over that pour the water. Thus the liquid will be nicely filtered into the other division at all times. The supply need not be cut short when you are putting in fresh droppings; it will always be free from sediment and clear. Place the tank in some handy position near the houses, or in the frames and pits, surround it with a slight brick wall, and cover it with a hinged wooden shutter, to keep out the leaves, &c.; and the use or preparation of liquid manure of the best kind will never afterwards offer the slightest difficulty to the amateur. One word more: always dilute it well, as strong, thick, and undiluted liquid manure is death to many plants. As a rule it should have, if strong, thrice its bulk of water.

Composts are formed on the principle that different plants

require different kinds of earthy or mineral substances. Not many plants can grow in pure clay, pure peat, or pure sand, though a mixture of these three kinds of earth is perhaps the most useful soil for general purposes. The reason is, that pure clay, from the close adhesion of its particles, will neither admit the entrance of the air nor the escape of the water; that pure peat, being formed entirely of vegetable matter, cannot afford the mineral substances required by the plant; and that sand, from the want of adhesion of its particles, cannot retain sufficient water to keep the plants alive. When these earths are, however, mixed they correct each other; the clay gives tenacity to the sand, and the sand lightens the clay by rendering it more porous, while the peat contains a supply of the principal elements of vegetable life.

It is well known that different kinds of plants require different kinds of soils; as, for example, the American Rhododendrons, Kalmias, Heaths, and other hair-rooted plants, are so commonly grown in peat-earth mixed with sand, that this compost is generally called heath-mould. Various kinds of Australian plants, particularly the ornamental ones with pea-flowers, such as the Kennedias, Chorozemas, &c., require heath-mould; as do several of the finest plants from South America. Geraniums, on the contrary, and most of the Cape bulbs, grow best in loam, that is, clay mixed with sand, either naturally or artificially. It is a curious circumstance, that plants belonging to the same genus often require different kinds of soil, and thus, as Dr. Lindley observes, "the *Alnus glutinosa*, or Common Alder, flourishes in wet clayey meadows, while *Alnus incana*, or Upland Alder, is equally suited to a dry and light land; we are totally ignorant of the reason of such a case as this. *Rhododendron hirsutum* and *Erica carnea* are, in their wild state, confined to calcareous soil; while *Rhododendron ferrugineum* grows exclusively on granite, and *Erica vagans* on serpentine." To find out the likes and dislikes of plants in this respect is of the highest importance in gardening.

Making hotbeds.—Hotbeds are generally made at this season for early cucumbers and melons, and also for tender flower seeds. A sufficient quantity of stable-dung being provided in about the proportion of a cart-load to each light or sash of the frame, the dung should be thrown up into a heap four or five feet in height, and if any part of it should be dry, water should be sprinkled over it, from a watering-pot with the rose on. The heap should then be suffered

to remain three or four days till a brisk fermentation has taken place, which will be evident by a light vapour rising from it, which smells like hartshorn, and is the ammoniacal gas. The manure should then be turned over, and sprinkled again if necessary, and it should afterwards be suffered to remain till it ferments a second time, when it should be again turned; and these processes should be repeated till the straw part of the manure has become so tender as to be easily torn asunder with a fork. The manure is then ready to be made up into a bed. If the ground should be covered with snow, of course the space required for the hotbed must be cleared before laying down any of the manure, and a fine day should be chosen for the bed to be made. The bed should be placed on a platform of soil six or eight inches above the general surface, to preserve it from wet; and it should be of such a length and breadth as suit the frame or bottomless box which is to be placed upon it. If the bed is intended for cucumbers and melons, the manure should be three feet, or three feet and a half thick, and a full cart-load of manure, or from twelve to fifteen large wheelbarrowfuls, will be required to each sash or light, but this soil must be put in gradually, and at first. A mound in the centre, and a couple of inches over the bottom of the frame, will suffice. The width and breadth of the bed should always be a foot wider than the frame each way, and the manure should be spread equally in layers, taking care to make each layer as flat and as firm as possible, by striking it with the back of the fork, but not treading upon it as is sometimes done. When the bed is formed, the upper surface should slope a little to the south; the frame is then put on and kept close till the steam rises, when the glass light should be opened to let it out. In about a week, if the heat has "got well up," as gardeners say, the frame should be taken off, if the bed has settled irregularly, and the manure should be levelled near the outsides of the bed; but the middle should be hollowed out, so as to be six inches lower than the outsides, as this will allow a greater depth of soil in that part, and there will be less danger of burning the roots of the plants. After the frame is replaced on the bed, the lights should be kept closed till the steam rises again, when a little air should be given. After the bed is sufficiently sweet, which may be known by a lighted candle remaining burning when shut up in the frame, some light soil, such as vegetable or leaf-mould sifted, should be laid over the whole surface of the bed to the depth of

three or four inches; but it must be understood, that this fine soil is only for the purpose of keeping down the rank heat. When hotbeds get cold they are lined—i.e., surrounded by a wall of stable-manure. These linings consist of layers of recent, that is, undecayed, or only partially decayed, manure. They should be two feet and a half thick at the bottom, that is, in the part nearest the ground, and eighteen inches at the top, which should be carried as high as the top of the frame. As a rule the temperature of the hotbed should vary from 70° to 80° , and of course be lower at night than in the day.

Plant Houses.—As the management of hothouses and pine-stoves requires the constant attention of a good gardener, and as I write only for amateurs, I shall confine what I have to say under this head chiefly to greenhouses and conservatories, adding a few observations on the management of vines, for the benefit of those who grow vines in their greenhouses, and giving some directions for managing a small flower-pit or house for striking cuttings, raising half-hardy plants from seed, and bringing hardy plants early into flower.

Management of the Greenhouse and Conservatory.—As greenhouses and conservatories are often confounded together, it may be useful here to mention that a greenhouse is generally supposed to be intended for the reception of smaller plants than a conservatory, and it is furnished with either a stand of wooden shelves, or a brick-pit in the centre, with shelves round it. In a conservatory, on the contrary, there are few shelves, which are never in the centre; and the plants are partly planted in beds of earth, and partly in pots or tubs, the latter being frequently brought from the hothouse or some kind of pit, and placed in the conservatory merely while in flower. Conservatories require rather more heat than greenhouses, and at this season they should be kept at about 50° in dull weather by day, and not more than about 5° lower at night; but during clear weather, the day temperature may rise from 10° to 15° higher, provided air is admitted freely. In greenhouses the thermometer should never be allowed to fall lower than 40° ; but when it is above 45° in the day, air should be given by letting down the top sashes. Giving air to plant-houses is an important point of culture, and it should be particularly attended to during winter. As the air in a plant-house during winter is always warmer than the open air, and as it is the tendency of heated air to ascend, when the upper sashes of the

house are opened, the heated air of the house passes out before any cold air can enter; but if the lower sashes are opened first, cold air rushes in before the heated air can escape, and the heated air being condensed by the cold air (as steam is in the worm of a still), falls back upon the plants in invisible drops. Air should therefore always be given first by opening the top sashes, and then those below; but the lower sashes should never be opened on the windward side of the house. In town gardens a small greenhouse very often opens out of a living-room; and when it is very small, enough warmth will proceed from the ordinary fireplace to preserve a few common plants from the frost, such as calceolarias, myrtles, azaleas, fuchsias, and the hardier kinds of verbenas. All the kinds of geraniums, or pelargoniums as they are now called, require rather more heat during the winter than most other greenhouse plants; as they suffer exceedingly when kept in a low temperature, the leaves falling off and the ends of the shoots decaying.

Many of the suburban greenhouses have a gas-light or lamp in them, which gives out considerable heat, but which, if it is a common open light, is injurious to the plants; as from being only lighted at night, it stimulates them into action at a time when they should be kept in a state of complete repose. Seasons of alternate action and repose are as necessary for plants as human beings; and, where plants depend upon artificial heat entirely, gardeners always take care to keep the temperature lower at night than during the day. The chemical changes also which are produced in plants are quite different in light and darkness; and as both are necessary to keep plants in health, it is evident that plants that are kept in a strong light during the night, are like human beings that are kept in a state of constant excitement by going to heated assemblies every night instead of having their natural rest. When greenhouses are heated by gas, it should be by a proper apparatus contrived on purpose, as will be described when the plans for building greenhouses and the modes of heating them are given, under June.

All plants in pots should receive much less water in winter than in summer, unless it is the nature of the plants to mature their growth at that season, or that they are required to flower or fruit at unusual periods. All plants must have a season of rest at some time of the year; and though exotic plants are not compelled to rest during the winter, like plants in the open air, it is generally advisable to give them rest at that season, as the coldness of the

atmospheric air, and the feebleness of the sun's rays, render it difficult to supply them with sufficient heat and light to excite them to vigorous growth. Attention should, however, be paid to the seasons at which exotic plants flower in their native countries ; as, notwithstanding the unnatural state in which plants are kept in pots, they usually show a tendency to follow their natural habits in time of flowering, &c., which it is better to indulge when it can be done conveniently. Though water should be given scantily at this season to most of the plants in the greenhouse, an exception should be made in favour of those which stand near flues and pipes, or other positions in which they are rapidly dried, as they usually become excessively dry, and it must never be forgotten that the small space to which the roots of a plant in a pot are confined, renders it necessary to give them water much oftener than the same plants would require in the open ground. It is necessary, therefore, frequently to examine the surface of the pot ; and if the earth appears dry, particularly if it will crumble into dust when rubbed, or if it be cracked away from the sides of the pot, the plant wants water.

Sometimes, however, the surface of the earth looks moist, and yet the plant droops and appears to suffer for want of water ; and this may be the case, as when the ball of earth has become hard, either from being suffered to become too dry, or other causes, the water will run down between the outside of the ball of earth and the pot, without moistening the centre. Sometimes also the drooping of the plant is occasioned by worms, and in either case the roots should be examined by turning the plant out of the pot. To do this without disturbing the roots, the pot should be taken in the right hand, and the left hand should be placed on the surface of the earth in the pot, allowing the stem of the plant to pass between the second and third fingers. The pot must then be turned upside down, and the rim hit slightly against a table or any hard substance that may be at hand. This will loosen the earth so that the pot may be taken off, leaving the plant and its ball of earth entire in the left hand. The roots may then be examined at pleasure, and any worms that may be found amongst them should be picked out. Care should be taken in replacing the pot, not to alter its previous position ; as, if this is not attended to, and the pot should not be perfectly circular, a vacant space will be left between a portion of the roots and the pot, which will permit the water given to pass off without sup-

plying the necessary moisture to the roots. Sometimes the earth on the surface of the pot looks green and damp, and when this is the case, the plant has had too much water ; that is, the water that has been given to it has remained in a stagnant state about the roots. In this case the ball of earth is liable to be broken when the plant is turned out of the pot, and it is, in most instances, the best plan to repot it immediately, first shaking all the loose wet soil from the roots.

During the winter, greenhouse plants should be watered in the morning, about two or three times a week, according to circumstances, taking care never to give water unless the plant appears to want it. No plant in a greenhouse should during winter be placed in a saucer, and in all cases where plants are kept in living-rooms, and the pots containing them are, from necessity, placed in saucers, no water should be suffered to remain in the saucers, unless in the case of very thirsty plants. Whenever plants in pots have dead leaves, they ought to be taken off, both for the sake of neatness, and for the health of the plants ; but care should be taken not to tear them off roughly, as it is highly injurious to a plant to have the skin of the stem or branches wounded. The leaves of endogenous plants, such as the yucca, or Adam's needle, and all bulbous and other plants having longitudinal or parallel veins, should be allowed to remain on the plant until they are sufficiently decayed to come off when slightly pulled.

A Propagating and Flower-forcing House or Pit is a very useful structure where there is space to allow of its erection, and where the extra expense it will occasion is not an object. It may be of very small dimensions, and it will not require to be at all ornamental. It should be heated by hot water, and directions for its construction will be given under the month of June ; but it may be erected at any time during the summer. In this house or pit a few old stock plants of any kind of bedding plants may be put every year about this time, in order to force them to produce new shoots for cuttings, from which the young plants may be raised which will be required for turning out into the beds and borders during the ensuing summer.

This house or pit will prove of the highest value for forcing bulbs, shrubs, &c., and on a shelf near the glass a neat little crop of strawberries may be forced. The tenderest of the subtropical plants now becoming so fashionable may be started and grown here. The seeds of tender subjects may be raised, and the house be most useful

to the amateur in many ways. By keeping it heated through the autumn months before forcing begins, it may be used as a small stove, or for perfecting the bloom of such winter flowering plants as the Epiphyllums and Poinsettia.

The Lily of the Valley in Pots.—Forced lily of the valley has of late years become one of the most admired ornaments of our spring flower-shows and well kept conservatories and greenhouses, but amateurs rarely succeed with it, and therefore a detailed account of a very successful mode of growing it is given. It is easy to grow it to tolerable perfection in the open air, but the forcing of it indoors requires some little attention. Its culture in pots is frequently attempted with a very poor result—so poor, indeed, that the flowers are not to be seen—while others succeed pretty well by buying imported roots from the nurseryman every year. Alphonse Karr says the flowers of the lily of the valley are like pearls in shape and lustre, but like pearls perfumed. Considering that it is a plant wild in abundance in some parts of this country, those who pay a high price for it every year for forcing may well liken it to such a precious gem for an additional reason, particularly as the plants are often thrown away as useless after being forced. The following plan of culture is much better and cheaper than that in common use, and certain to produce finer plants of the lily of the valley than are often seen even at our best spring flower shows.

For a beginning it would be better to secure "imported plants," as by so doing we insure a bloom during the current spring, and commence at the same time to accustom the plants to the treatment which must be annually pursued. However, it is by no means necessary to buy imported plants, as those potted up from the plantation in the open ground will do; but they must get a year's residence in pots before flowering well. We will suppose that imported plants are prepared and forced, or, if not imported plants, some that are in pots with a view to bloom in the houses in early spring. The forcing of the lily is so very simple that we need not describe it here. In a warm vinery, in a melon or cucumber frame, on a shelf in a forcing house, or in any like position, it comes into bloom with facility, provided always that the plants are furnished with strong flower buds. It is the want of these that we have to guard against. Given plants well furnished with prominent roundish buds, bringing them into bloom in a heated structure is a thing that anybody can perform; but no skill will suffice to make presentable plants

unless they have well-filled "crowns." Now the secret of getting these desirable buds consists in allowing the plants to make a perfect and healthy growth after flowering. By causing them to do that, we secure finer plants without any additional cost than are imported for the special purpose of forcing. Judging from the plants seen at shows, and in many gardens, they are not kept from year to year. The finest plants I have ever seen were regularly forced during the past five years. Once out of flower, instead of being thrown aside in some out-of-the-way place in the open air, they are placed in a comfortable frame, or on the shelves of a cool house near the glass, anywhere in fact where they may have perfect protection, and continue their growth without the slightest check. Should any one think that, from being hardy, they may be placed in the open air with impunity before the frosts and all danger are gone, and act upon it, a decided mistake will be committed. No matter how hardy plants may be, once excited in a high temperature, in winter or spring, they must be retained therein till genial weather arrives, or they will be destroyed or much injured. It is just like what occurs with the hyacinth, and also with other forced flowers when out of bloom, generally they are exposed to cold, and neglected or badly treated, and flower very poorly or weakly the year afterwards, so much so that people usually throw them away altogether as useless, whereas, if placed in cold light frames, and permitted to make their growth and die down un mutilated, they would prove quite as good as at first. In the case of the lily of the valley a much better result is gained by this management than from the expensive and specially prepared crowns. If brought into bloom very early, say Christmas, the plants should be allowed to grow away for three months in any place that may be spared. Those that are in bloom now, in February, should be kept in such a position as beforenamed for about two months to come, when they may be placed in the open air, plunged in coal ashes in some sunny spot, and there allowed to ripen and gradually die down to rest. Once that stage has arrived, it matters little where they are, but the most convenient plan will be to leave them plunged in the coal ashes, and, as batches are wanted from time to time to introduce to the forcing house, take them up, clean their pots, refresh their surfaces, and place them in the desired position. The chief point once settled, there remains the potting and little else

Should the plants, when done flowering, be closely packed in rather small pots, as is usually the case, it will be better to replace them in pots a size larger, not mutilating the roots more than may be necessary for efficient potting. And when these plants in their turn fill the larger pots so that repotting seems again desirable, each specimen may be cut in two, and the stock increased. It is not desirable to grow them in pots more than eight inches across or thereabouts, unless in special cases, when a wide pan or pot is desired. Another advantage of this mode of culture is, that the plants grown after it are furnished with abundance of healthy large leaves expanding with or before the flowers. The plants usually seen are but sparsely furnished with leaves while the flowers are out. Thus, if any one thing be clear it is that buying lily of the valley roots from Continental gardeners is unnecessary. If beginning with roots potted from the open garden, I should select the plumpest and most likely crowns, try and get a few flowers from them during their first spring in pots, and in any case treat them so as to insure a perfect bloom the following season; every second year would suffice for the potting or dividing of the plants.

Cuttings may be made of several kinds of greenhouse plants at this season. They should be plunged into a gentle bottom-heat, and a moist atmosphere should be kept in the house or pit, taking care, however, to give air in the warmest part of the day, so as to prevent any danger of the cuttings damping off. As to the various ways of striking cuttings it has been found that no mode is more efficacious to produce roots than what is called bottom heat, whether it is produced from manure or hot water. The essential principle of bottom heat, is to keep the soil in which the plants grow, whether in a pot or otherwise, at one regular warm temperature; and this is the process we find in nature, where the earth at a short distance below its surface is at the same heat night and day, the mean temperature of the soil being always a degree or two above that of the atmosphere. No plan the majority of amateurs can adopt is more efficacious for striking cuttings than the old-fashioned hotbed, if properly managed; and even where there is a forcing-house, a hotbed for raising seeds and striking cuttings will be found a very useful auxiliary. This hotbed should be made like those described in February, for cucumbers and melons; but a one-light frame and one cart-load of manure will probably be quite sufficient.

If no plants are to be forced into early flowering, the hotbed need not be made till February.

Cold Pits for half-hardy Plants.—These are the most useful, and least expensive structures for preserving plants during winter; and by the aid of one of them, a sufficient number of greenhouse plants may be preserved to fill a large garden, when planted out in the summer. The plants in it should be kept as dry as possible, as they will then be in a much better condition to resist frost. Air should be given by tilting or drawing off the lights every mild day between ten and three o'clock, but they should not remain open longer than the latter hour, and they should be covered with mats, or something of a similar nature, every evening between four and five, when it appears at all likely to freeze, and in severe weather they should be thoroughly protected with litter and tarpaulin as well as mats. The plants in the cold pit should be frequently examined and kept free from decayed leaves, and the surface of the soil in the pots should be kept clear from weeds and moss. The watering of the cold pit is a very important point. At this season scarcely any water is required, as the moisture of the pit is generally sufficient, but it should be examined every week or so, and only those plants watered that seem to badly require it.

The Vinery.—If the vines were not pruned in December, the pruning should be done as early as possible in this month, as January is the last month in which it can be done with safety, on account of the rapid rising of the sap; and the loss of vigour in the plant if it is suffered to bleed, as the gardeners term it, which it will do copiously if pruned after the sap has begun to rise. Great care should be taken at this season to keep the vine border mulched, or otherwise protected from the frost. It is customary in vineries, where pines are grown or greenhouse plants kept, to draw the stem and branches of the vine out of the house, and leave them exposed to the cold during the months of November, December, and January; but this is a dangerous practice, as exposure to the cold during a severe frost is very injurious to the stems of the vines. And when vines are taken out the stems should be placed as near the ground as convenient and well protected with litter.

Garden Enemies.

Quadrupeds.—In country places *hares* and *rabbits* do a great deal of mischief in this month, as from the severity of the weather (particularly when snow is on the ground), they are unable to obtain their usual food. They are particularly destructive to pinks and carnations, but their ravages may sometimes be prevented by sticking matches, or sticks dipped in melted brimstone, or in skim milk mixed with soot, or any other offensive-smelling mixture, round the beds it is wished to preserve; or covering them with a worsted net. Fruit-trees may be preserved from the attacks of all gnawing quadrupeds by washing them with a mixture of soapsuds, soot, lime, and guano, made of the consistence of paint. Mice are often very destructive to crocuses at this season, and should be destroyed by figure of 4 traps.

Birds can do little mischief at this season, as there are neither buds nor fruit for them to peck. The missel-thrush and the field-fare, however, feed upon haws and other berries, as well as upon worms and insects; and the song-thrush, the blackbird, and the redwing strip the holly bushes, the pyracantha, and the ivy of their berries, though they seldom take the latter unless pressed for food.

Insects.—At this season scarcely any insects are to be seen, as the few that are in existence are in a state of torpor. This is frequently the case with the nettle, peacock, and wood-tortoise butterflies, all of which, when they happen to appear late in the year, will take shelter in some shed or retired place, and not unfrequently in the curtains of rooms seldom used, till they are revived by a warm day in spring, when they flutter about for a time, but soon die if they are exposed to the cold. The eggs of insects, however, may be found abundantly at this season, and sometimes in curious situations. Some are deposited on the bare twigs of trees; others are laid in cracks in walls; and others, on the leaves of plants under water. The eggs of butterflies are generally extremely hard, and can only be affected by moisture and heat combined. The eggs of the ghost moth are usually laid on the roots of herbaceous plants that have been killed down to the ground, so that the caterpillars as soon as they are hatched are ready

to feed upon the young shoots as soon as they appear. The eggs of the winter moth will be found at this season on the branches of fruit trees. They are so small as to be scarcely perceptible to the naked eye, and, even when seen, they only look like little light-green specks, or short lines, upon the bark, to which they are so firmly glued that they cannot be washed off, and indeed cannot be removed without wounding the bark. They are very numerous, one moth frequently laying more than two hundred. The caterpillars are hatched in spring as soon as the buds of the trees begin to swell: they are at first grey, but they soon become of a light green; and they are called green loopers, because, having no ventral feet, they are obliged to draw their hind feet to their fore ones when they wish to move, thus making a loop or bow of the centre part of the body. They are very slender at first, being little thicker than a horsehair, and almost transparent, and while they are in this state, they hide themselves just within the calyx of the buds, where they protect themselves by spinning a fine web. As soon as the buds unfold, the caterpillars feed upon the young leaves and blossoms, greatly preferring the latter, and of course destroying whatever they attack. But the most remarkable eggs of insects which are found on the twigs of trees are those of the lackey moth, which look like beads, and which are glued together so firmly as only to be separated by a penknife; and those of the gipsy moth, which, having a thinner shell, are formed into a mass, firmly attached to the wood, and then covered with a quantity of soft down, which the female moth plucks from her own body to protect them. Other insects pass the winter in cocoons, or in the chrysalis state, and Kirby and Spence calculate that this is the case with nine-tenths of the moths and butterflies, and with several of the most destructive kinds of flies.

Nearly all the *beetles* lay their eggs at a sufficient depth in the earth to be protected from the frost, as do the mole-cricket, and the grasshoppers. The aquatic beetles lay their eggs on water plants, buried sufficiently deep in the water to be out of danger from the cold. Many of the beetles remain alive in a perfect state during winter, sheltering themselves under stones, in hollow trees, and rotten wood, and sometimes under the dead bark of living trees. The eggs or insects found should be destroyed as much as possible, as the larvæ begin to eat as soon as they are hatched, and do incalculable mischief in a short time.

Snails hibernate in a state of complete torpor. Just before the cold weather sets in, they crawl into holes and crevices in walls, and shut themselves up in their shells by forming a thin scale, called an operculum, which just fits the opening in the shell, and which becomes glued to it so firmly, that the whole appears one solid piece. At this season, therefore, snails should be sought for in their hiding-places, and it is best to destroy them by throwing them into strong limewater, as it is extremely disagreeable to crush them when found in large quantities.

FEBRUARY.

General Observations and Directions.

The Weather, &c.—At the beginning of the month there is generally abundance of rain or snow. When the snow melts away, numerous flowers appear, though the ground is generally too wet to allow of any gardening operations to be performed till towards the end of the month. On Candlemas Day (the 2nd of February), if the sun shines, it was formerly considered a bad omen, and on this day the holly and the ivy that were used to decorate the houses at Christmas were removed. A great change in the weather takes place in the course of this short month, which, though it begins with frost and snow, generally ends with the mild sunny weather of early spring.

Open Garden.—The spring flowers are beginning to peep, and will now invite a little more neatness in their immediate vicinity. A little cleansing and freshening up of the ground after the winter is very desirable, and the gaps caused by the hard weather should be made good. Rearrange herbaceous and rock plants, plant out such if the weather be favourable and ground dry. If the arrangement of the flower garden be not already determined upon, it is high time to do it. Lawns and croquet grounds should now be thoroughly rolled, which will much improve them. Trim the edges of walks, and roll them to get rid of the loose and untidy aspect usually imparted to them by the winter's frosts and rains. Prune roses, Hybrid Perpetual, and Bourbon. The buds of apricots, peaches, and nectarines will now be swelling perceptibly—a hint that all pruning and nailing should be finished out of hand immediately. Where grafting is practised preparation should now be made for it. Generally speaking, it is not a lucrative thing for the amateur or gardener to practise, being done so largely and successfully by trade cultivators; but there are in most gardens occasions where it must be done by the cultivator. Head back the stocks,

and determine upon all the grafting to be done. Clean the stems of fruit-trees from moss, lichens, and scale, if the latter exist, using a rigid scrubbing-brush, sand and water.

The season for seed sowing is approaching, and it will be well to bear the following in mind. A too scrupulous adherence to stated times for sowing seeds is often attended with the loss of the crop. We should look to the weather also. If, when our seed time arrives, it be frosty, or harsh winds prevail, it is useless to sow seeds under those circumstances: seeds sown some ten days after, in favourable weather, would outstrip them at least ten days. Never sow all your seeds at once; make two or more sowings, let the quantity be little or much. One reason why two or more are recommended, is that in case the first crop is cut off we may succeed with the second or third. Cold stiff clays should not be sown as soon as light, sandy, warm ones. The former take more seed than the latter.

Sow a few rows of the early horn carrot, also some chervil, leeks, and lettuce. Sow also some early cabbage, onion seed, and radishes, on a warm border. Put in the first principal crops of tall marrows, British Queen, and similar peas, to come in after the earlier kinds of course. For pretty obvious reasons the autumn and winter sown peas very often perish; and therefore some gardeners in early spring are in the habit of sowing earlier kinds of peas in semicircular drain tiles, rough narrow boxes, pans or anything of the sort. They sow them in a frame or pit, and plant them out when the season and ground are ready for them, instead of letting them struggle away all the winter. It is often a good plan, and peas sown thus, about this date, may be fit to pull before those sown in November in the open border. To get in a sowing of parsnips should be one of the first things done on a fine day, when the ground is in good working order, for it is a great advantage in parsnip culture to get the seed in early, as it is to thin early and well when the plants are up. Choose a deep and well pulverized soil with no fresh manure in it. Ground that has been thoroughly well manured a year or so ago should be selected. Where there are good turnips on the ground it will be well to take them up at this season, not only to clear the ground, every spot of which will soon be in request, but to prevent the turnips from running to top, and thus become uneatable or nearly so. The tops should be cut off, and the bulbs then buried

in sand or earth in a cool place, or in fact pitted somewhat like potatoes. Propagate all sorts of herbs that are increased by division of the roots.

Planting may go on still, though it is not the best time of year for it; nothing like the early autumn days for all sorts of planting. The weather may possibly cause the tops of stored roots to sprout, and if so they should be cut clean off. In some soils good work may be done any day in the year; but on heavy clays it is a loss of labour to attempt it till the drying winds have taken the glue out of the stiff soil to some extent.

Indoor Department.—It is in the glass-houses, &c., that most of the work has to be done now, but every lengthening day will give more opportunity for out-door work, and things should be so arranged in doors that all available help may be applied out of doors when the weather is very favourable.

The conservatory, or whatever answers that purpose, should at this time be delightfully gay and attractive: the lily of the valley, the rose, lilac, and other charming hardy things, there meeting the camellia, and various natives of warm climes, and bearing away the palm for beauty. To exhibit so much to the best advantage is worthy of some consideration, and at no time of the year should more attention be paid to this very point than at present, when we have little or nothing out of doors, but a profusion of flowers within, which, if tastefully disposed, is sure to charm all beholders. The most graceful and presentable of the general stock of plants should be associated with the spring flowers; all parts of the house should be kept perfectly clean and neat, and the dead flowers, &c., removed every morning. As in most places the flowers are grown in other structures than the conservatory, a point of some minor importance is to settle the stage at which they should be removed to the conservatory. If allowed to open fully in the forcing-house, they may hurt in transit, for forced and early flowers grown indoors are very readily affected by a dry cold breeze, or any change, by passing from one house to the other. It is better to remove them when the buds are just ready to open, and in the bud-state plants are usually attractive.

The early vinery will now require constant attention: rubbing off the superfluous shoots, and stopping the fruiting ones a joint or two beyond the young bunch of flower. The peach-house too

will now be gay with flower, and should be kept dry and airy. Where there are orchard or other well-lighted houses, with borders of good earth inside, peas or other early crops may be brought forward in them, and often without in the slightest degree interfering with the larger and more important contents of the houses.

The forcing of strawberries successfully is one of the most interesting labours of the indoor department, and the shelves of ruddy strawberries one of the prettiest sights under glass. It should be noted that when these are in flower, they should have abundance of air, and be kept near the glass, so as to enjoy as much light as possible, while not kept too hot; 65° will be quite enough for them. Early carrots, radishes, &c., growing in frames, should have plenty of air on all favourable occasions, and so, above all things, should early potatoes. Succession crops of rhubarb, seakale, and asparagus should now be started. The frame or pit containing the earliest crop of cucumbers should have attention, to keep it genially warm and nicely cultivated. They should be well watched during the strong phases of sunshine which sometimes occur during this month, for an hour's neglect in a brisk sun may play havoc with the crop. Successional sowings of French beans should also be made. The raising of such young plants as tomatoes, cap-sicums, and many like subjects, both for the open air and for pot culture, should now be commenced, and also annual subtropical plants—like the castor oil. It is quite simple, but requires to be done early, and the young plants kept clean, near the glass, and potted as their requirements may demand. Sometimes, in the hurry of spring, such things are left to get drawn under other plants, and not "potted off" in time; and this neglect has a very bad effect on their future value, as when once in a wiry and starved state, it is with difficulty and much loss of time they get out of it, if indeed they ever thrive so well as young plants that have been grown on singly and well from shortly after their emergence from the seed leaf.

The stored fuchsias are now pushing, and should be brought to light, pruned, and set in a fair way of growing. Any that it is intended to bed out, should be kept in a cool and dark place, so as to prevent them making any leaves *before* they are placed in the open air. Ferns, and any other things that require it, would be better potted now than left till a busier day. Cuttings of bedding-plants

should now be struck in any tolerably warm and moist house or frame. The increasing sun, and occasional dry, breezy days, will necessitate more watering than has been the case for some time, and soft and freely growing things should be carefully attended to, as they will now begin to require plenty.

Things not to be done in February.

Do not forget that if only a few plants are infested with green fly it is not necessary to go to the trouble and expense of fumigating a whole house. Some small house or pit, or even large box, with door, may be devoted to this purpose, and the various plants infested fumigated as occasion may require. By steadily pursuing this system much trouble may be saved, and the wholesale injury done when the aphid is allowed to completely infest a house avoided.

In thinning early grapes, do not neglect to handle them very carefully; do not let them get larger than radish seeds before thinning them, and do not permit them to get rusted from draughts of cold air being allowed to flow directly over them.

Do not forget that where there is danger of peach-houses, vine-ries, or other houses being infested with red spider, a good preventive is to smear the pipes when cool with a little sulphur mixed with thin gum water.

In attempting the cultivation of the greater number of stove-plants, and the early forcing of vines and flowering plants, never forget that the most useful agent for affording that genial moisture so conducive to the health of these plants, and also much of the necessary heat, is a mixture of leaves and half-spent stable manure, and do not neglect to make a provision for obtaining these materials when required.

Never neglect to follow the plan of husbanding heat pursued at this season by all good forcing gardeners, *i.e.*, shutting up the houses early in the afternoon, and syringing immediately afterwards. This practice secures a genial growing warmth till late in the evening, saves fire heat, and has been proved to have the best results on the health of the plants.

Never allow the conservatory to be infested with vermin of any kind. Its safety from these will be best secured by examining every plant before introducing it, and never putting a plant in it

that has any trace of insect pests. Avoid fumigating this structure if possible; if its contents are only partially infested, the plants may be removed and smoked elsewhere.

Never apply liquid manure of any kind without diluting it thoroughly with water. Chrysanthemums and other plants of the strongest constitutions may be quickly killed by very strong liquid manure. Strong dark liquid manure brought directly from the farmyard should be diluted with three times its bulk of water, and no matter what kind is used it should be very weak and clear, and in that state may be used with the best possible result to many classes of plants. During the present month good plantsmen begin to use it freely for various soft-wooded subjects, and also to rapidly growing camellias, oranges, azaleas, &c.

Do not postpone the immediate propagation of all bedding plants of which there are cuttings ready, and which are not sufficiently abundant, but begin at once. Almost every bedding plant strikes with the greatest facility early in this month.

In pruning the peach and nectarine during this or the following month, do not leave the fruiting shoots long, as is a frequent practice, but cut them back to within five or six inches of the base.

Do not prune tender shrubs that have been partially destroyed by the frost till the part that is not killed has begun to shoot; but if the upper portion of the tree or shrub be seriously injured if not killed, it is better to cut it down nearly to the ground so as to insure a vigorous and unblemished growth.

After sowing seeds in clayey soil, do not press heavily upon the earth with which the seeds are covered.

Never turn shrubs or plants of any description out of pots into the open border, without breaking the ball of earth about the roots, and spreading them out if they are matted together.

Never dig holes for shrubs below the good soil on a clayey sub-soil; for such holes only become receptacles for water.

Never allow melted snow to remain about the roots of plants, but cut channels to drain off the snow water wherever the soil is clayey.

Do not begin digging till the ground is tolerably dry.

Do not prune fruit trees in a hard frost.

In frosty weather when wall-fruit trees have been covered up, do not expose them suddenly to the sun.

Principal Operations in February.

Sowing the Seeds of Melons and Cucumbers.—The hotbeds that were made in the kitchen-garden will now be ready for sowing; or if hotbeds were neglected to be made in January, they may now be prepared in the same manner as is directed under that month. The seeds of melons and cucumbers are nearly alike, but the melon seeds are rather the broadest: they are oval and almost flat, being only slightly swelled out in the centre. As many of them are bad, they should be tried before they are sown, by putting them in water, and only those that sink should be chosen. The pots in which melons and cucumbers are sown should be perfectly clean and dry, in order that the balls may be turned out entire, without injuring the roots, when the plants are to be transplanted. The seeds should be sown, and covered with earth about half an inch deep; and the pots may then be plunged into the bed about half their depth if the bed is small, and one quarter their depth if the bed is large, drawing up a little earth round each pot. The glasses should be put on, and kept close till the steam rises; but as soon as this is the case, the sashes should be raised about an inch at the upper end, to let off the steam, and this should be continued until the steam has ceased rising. As soon as the plants appear, which is generally a few days after the seeds are sown, they should have an increase of fresh air every day between twelve and three; but if the weather should be very frosty, a mat may be thrown over the opening. If the weather, on the contrary, should be mild, the glasses may be left open all night, half an inch high, covering the opening with a double mat. This is to prevent the steam of the bed from injuring the tender plants.

Great care is requisite in the watering: the pot containing the water which is to be used should be put into the bed the night before, or, as the pot will take up some room, glass bottles may be kept filled in the bed; the water should be applied to the earth so as to moisten the roots, but not to wet the tops of the plants, and as soon as it has been given, the glasses should be shut close for half an hour or more; after which they may be opened again for a short time, before it is necessary to close them for the evening. During frosty weather, the glass should be covered every night with mats. It is usual for gardeners to make two or three successive sowings at

intervals of a week, in order to secure a succession of plants. When the plants are three or four days old, they should be transplanted into other pots, which should be filled the day before they are wanted with moderately dry earth, and set in the bed all night, so that the earth in the new pots may be quite as warm as that in which the plants have been growing. Three cucumber plants may be placed in each pot, or two melons, a very little water having been given to the plants which have been transplanted; and the pots should then be plunged into the bed, close to one another, filling up all the spaces between with earth, so that no part of the manure may be left uncovered; as unless this is done, the rank steam rising from the manure may injure the plants.

The bed must be examined every day, and air must be given if the plants are found to suffer from the heat. The cucumber bed, at night, ought never to be below 65° of Fahrenheit, nor above 80° or 85° in the day. The melon bed should not be below 65° at night; but it may be suffered to rise to 90° during sunshine. If the bed is too hot, and the plants have not enough air, they will become of a sickly yellowish hue. If the bed sinks below the proper degree of heat, linings must be applied round the outside, of long stable litter, waste hay, or dried fern; and if this be not sufficient, a lining of horsedung, prepared in the same way as that which was used for the bed, must be added; taking care, however, if the new manure causes too great a heat, which may be known by the state of the thermometer in the bed, to draw the top part of the lining back, so as to leave a vacancy of a few inches between the bed and the dung lining. When the heat is somewhat moderated, the lining can again be pressed against the bed. As soon as the plants have advanced so far that two rough leaves are perfectly developed, the leading shoot should be pinched off while yet a bud just rising from the axil of the second rough leaf; and when they have formed two or three runners, they will be in a proper state for planting out. Where an amateur possesses a useful small forcing house or pit, with a bed of tan or a mixture of stable manure or leaves, melons and cucumbers may be raised in it, and the trouble of making a hotbed very early avoided.

Hotbeds for early Vegetables.—If it is desired to have lettuces, radishes, peas, or in fact almost any other vegetable, particularly early, the seeds of all of them, except peas, may be sown in the free soil, on slight hotbeds made with two feet deep of manure, and

six inches deep of good light garden mould. The peas should be sown in pots, in the same kind of mould, and the pots plunged in the bed. It may be here observed that though many early vegetables may be sown in the open air in February without any danger, yet, when a hotbed can be obtained, the early vegetables grown on one are more succulent, and consequently much better, from the rapidity of their growth, than those grown in the open air. Should frames with glass sashes be difficult to be procured, prepared calico may be used instead of glass; but when this is the case, care should be taken to give the plants abundance of air whenever the weather will permit. In forcing early potatoes in frames it is most necessary to take off the lights whenever there is no danger of the tops suffering from frost.

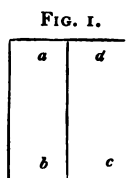
Hotbeds for raising Flower-seeds and striking Cuttings should be made in this month if not made in January, in the same way as before directed; but the manure need not be more than two feet deep, though it should extend three or four inches beyond the frame on every side. When the steam of the manure is sufficiently gone off, a layer of light soil should be laid over the beds six inches thick. In all other respects the treatment of these beds is the same as was directed for the other hotbeds; and indeed the cucumber-seed bed will answer the purpose as well as a fresh bed, when the young plants are removed from it.

Seeds may be sown of several greenhouse plants that may be treated as annuals, such as *Tropæolum peregrinum*, *Lophospermum scandens*, *L. Hendersoni*, and other kinds, *Maurandya Barclayana*, *Eccremocarpus* or *Calampelis scaber*, *Rhodochiton volubile*, and *Thunbergia alata*, *T. alata alba*, *T. aurantiaca*, and *T. a. superba*. Seeds may also be sown of various kinds of *Petunias* and *Verbenas*, of the Chinese primrose, of various kinds of *Lobelia*, such as *L. gracilis*, *L. Erinus*, *L. bellidifolia*, &c., and of the blue and the white *Brachycome iberidifolia*. *Cobæa scandens*, *Ipomœa rubro-cærulea*, Cockscombs, and various kinds of Balsams, *Phlox Drummondii*, and various kinds of *Mimulus*, may also be sown in this month, as above directed; and cuttings may be struck of nearly all bedding and soft-wooded plants.

All these seeds should be sown thinly in pots, or in broad shallow pans which are made for the purpose, filled with light leaf-mould and sand, and they should be plunged into the hotbed up to the rim of the pot. The atmosphere of the hotbed should

be kept moderately moist, as moisture is one of the conditions essential to the germination of seeds: another condition is heat, which is afforded by the fermentation still going on in the manure; and these two powerful agents, combined with the atmospheric air enclosed in the frame, and aided by the absence of light, induce the chemical changes which a seed must undergo before it can develop new parts, or, in other words, before it can grow. If more water, however, is given than the plant can decompose and assimilate, its germination is stopped, and it is in the situation of a person killed by indigestion; while on the other hand, if it is kept too dry, it becomes withered instead of expanding. It is also of importance that the seed should not be exposed to any variations of light, heat, and moisture; as any irregularity of this kind will so derange the delicate organs of the incipient plant, that the progress of germination will be stopped, and the vitality of the seed destroyed. As the process of germination proceeds, carbonic acid gas is slowly formed and liberated, so that the young plant, as it develops itself, becomes surrounded with an atmosphere from which it can assimilate its food. This atmosphere would, however, be painful to human beings; as it has often been remarked that climates peculiarly favourable to vegetation are injurious to human life, and that perhaps the most luxuriant vegetation in the world is in the West India islands and the neighbourhood of Cape Coast Castle in Africa, both of which situations are proverbially unhealthy.

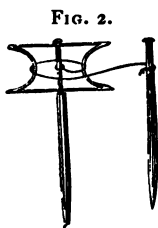
Digging is one of the most necessary and useful operations of gardening. It seems natural to suppose that it is merely a laborious employment, which requires strength more than skill; but so far from this being the case, the work of an unpractised hand may always be discovered at a glance, even by a casual observer. The gardener usually divides the bed to be dug into two parts; and then a trench or furrow, one spade deep, is opened at one end, as at *a* in fig. 1, the earth from which is placed at *d*. When the piece is dug to *b*, the soil from the opening at *c* will fill the trench left at *b*, and that which was taken from *a* will fill the trench at *d*.



Mode of digging a Bed.

When manure is to be dug in, it is generally spread over the surface, and then the ground is dug as before directed; or the

manure is laid in a heap, and as the ground is dug over, a little is placed in the bottom of each furrow. Trenching is merely digging to twice or thrice the usual depth, the trenches being marked out, two or three feet wide, with a garden line; and after the first opening is made two spades deep, the top spadeful of the next trench must be put in the bottom of the previous one, and the bottom spadeful thrown upon the top. Ridging is digging every other furrow, so as to form a deep trench, out of which the earth is thrown in a ridge on what would have been the next furrow, and left there exposed to the air all the winter.



*Iron Reel and Pin
for a Garden Line.*

Ground can never be dug in a very hard frost; but it is beneficial to loosen it up by means of a mattock or pickaxe, so as to allow the frost to penetrate to a greater depth than it otherwise would do. This is done partly to destroy the slugs, grubs, and cocoons of beetles, and other insects, which winter in the ground for the warmth it affords, and partly to render the texture of the ground more friable; as the freezing of the water in the soil rends the particles of earth asunder, just as the freezing of the sap in plants lacerates their vessels. Frost is particularly useful when the soil is clayey, or in any way adhesive, and in these soils it has been found that the diminution of their consistency after they have been exposed to the frost is about fifty per cent. No pains should be spared to expose very heavy clay soils to the action of frost in winter. In wet weather stiff soils should never be operated upon in any manner, and digging is particularly injurious, as the action of the spade presses the particles of the soil together, and increases its consistency so as to render it nearly impervious, and apart from this the labour of digging, &c., is far greater in wet weather than in dry.

Pruning Wall-fruit Trees.—The more delicate fruit trees, such as Peaches, Nectarines and Figs, are generally pruned in this month, if the weather should be sufficiently mild to make it probable that all danger from frost is over, though the peach may be pruned with safety till the end of March. If the object in pruning were simply to increase the vigour of the plant, the pruning would be better performed in autumn; but in pruning fruit trees the object is not to produce abundance of leaves and

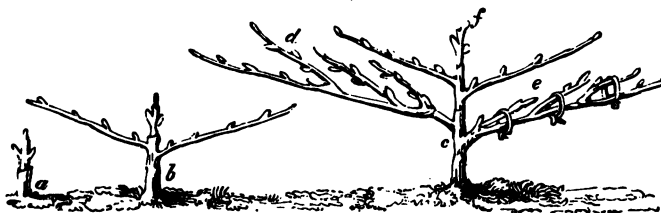
branches, but fruit; and consequently, the first rule in spring pruning is to cut off all the soft and unripened wood of the last year, as this wood never bears fruit, and yet would serve to draw up the sap so as to prevent its accumulation in the bearing wood. It may here indeed be observed, that the quantity of fruit produced each season depends principally upon the state in which the wood was, as to ripeness, the preceding summer. In looking over a Peach or Nectarine tree previously to pruning, it is necessary to distinguish the blossom buds from the leaf buds; and though it is easy to do this when the buds have swelled, it is very difficult when they are in a quiescent state; but if two buds are found at the same joint or node, one of them is sure to be a blossom bud, as the leaves of peaches and nectarines are alternate, and not opposite. The blossom buds are also thicker and blunter than leaf buds, which are generally known by the sharpness of their points. Where there are three buds, two of them are blossom buds, and the centre one is usually a leaf bud. This appearance of three buds is what gardeners call a treble eye. Sometimes nearly all the buds on a young shoot are blossom buds; when this is the case, the shoot must be laid in at full length, or cut to its base, as, if cut to a blossom bud only, it will die back to a shoot or leaf bud. Trees in a bearing state have generally their strongest bearing shoots shortened to twelve or fourteen inches, and the weaker to four or six inches, always cutting out the wood with a cut which slants towards the wall, so as to let the bud stand outwards, and to have the wounded part inwards or next the wall. The shoots that are left should then be trained neatly, nearly parallel to each other. Peach and nectarine trees require exactly the same treatment, and, in fact, are only varieties of one species; both being very nearly allied to the almond. The shoots of both of these trees may with advantage be cut back in spring much more than is the rule in this country. The French, who understand pruning and training so well, cut back the shoots of their peach trees to five or six inches, and this practice would answer quite as well in this country. The almond, however, being only cultivated for the kernel of its fruit, is scarcely ever grown against a wall; and what little pruning it requires is generally given in winter. The apricot also is generally pruned and trained in winter.

The fig requires scarcely any pruning, as the fruit is always produced on the young wood or midsummer shoots of the preceding year,

and the figs do not appear fully till the first flow of sap in spring. The shoots formed by this growth produce a second crop of figs, but these scarcely ever ripen in the open air in England, though the shoots on which they grow produce the buds which form the figs for the ensuing year. Buds are very rarely produced from the old wood. It is thus evident that the pruning of the fig should almost be confined to taking out the dead wood, and thinning out those shoots which cannot be easily trained to the wall.

Training Wall-fruit Trees is a very important branch of gardening, inasmuch as by the aid of walls we are enabled to perfect many fine fruits which do not ripen when grown as standard trees in this country. There are various modes of training trees against walls, but the best is what is called the fan manner, which consists in leading the shoots upwards, but slightly diverging from the stem, in the shape of a fan; or training the branches almost horizontally from the stem for three-fourths of their length, and then giving

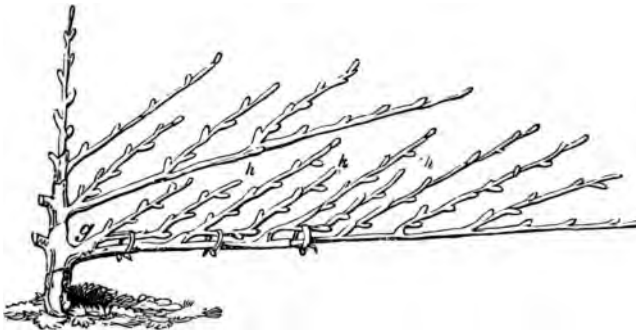
FIG. 3.

*Fan-training in its progressive Stages.*

them a curve upwards at their extremity. The fan manner is generally adopted with peach and nectarine trees, and to perform it properly, it should be commenced when the tree is in the very young or maiden stage. The usual way is to begin the training in the spring after planting, by heading down the plant to three buds placed in such a manner as to produce a leading shoot, and a shoot on each side of it, as shown at *a*, in fig. 3. The second year, the central shoot should be headed down to three buds, and the two side shoots left at full length, but all the buds should be rubbed off the lower side of these side branches, and only a sufficient number should be left on the upper side, to be from nine to twelve inches apart, as shown

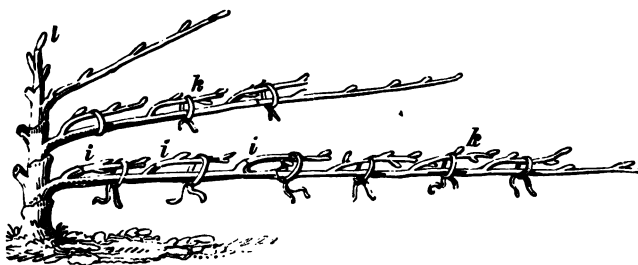
at *b*. At the end of the summer of the second year there will be a leading shoot and four side branches growing from the main trunk, and numerous small laterals from each of the lower side branches, as shown at *c*; and these are nailed to the wall, as at *d*. It will be observed, in the three trees in fig. 3, that the growth of each year is distinctly marked by lines across the main stem. In the third spring, the laterals which were nailed to the wall, as shown at *d*, are loosened and tied to the main branch, as at *e*, and the leading shoot is shortened to three buds, as at *f*; or, if the tree be very vigorous, to five buds. At the end of the third summer, the number of lateral shoots on the lower side branches will be doubled, as shown in fig. 4, a new lateral having sprung from the base of

FIG. 4.

*Fan-training, Third Stage, in Summer.*

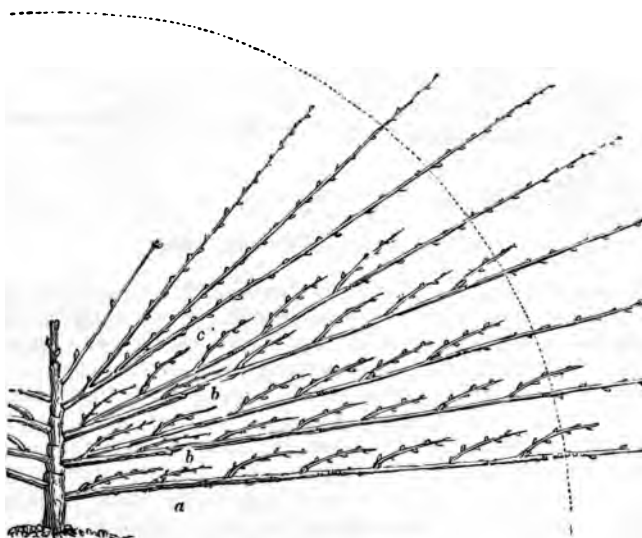
each one tied in, as at *g*, and another from its extremity, as at *h*. The tree may now be suffered to bear fruit. In the spring pruning of the fourth year, the original laterals, now of two years' growth, and which bore fruit the preceding summer, are cut off close to the branch, and the young laterals which sprang from their base are loosened from the wall, and tied down to succeed them, as shown at *i*, in fig. 5; the other laterals are tied in, as at *k*, and the leading shoot is shortened, as at *l*. In this manner the tree is trained each successive year, and the distance of the principal shoots from each other is regulated by a semicircular line about ten feet from the stem, as shown in fig. 6, and on this line are marked the distances

FIG. 5.

*Fan-training, Third Stage, after the Winter pruning.*

between the shoots, which are ten inches each; the lateral shoots being laid in about a foot asunder, as at *a*. Sometimes, in the

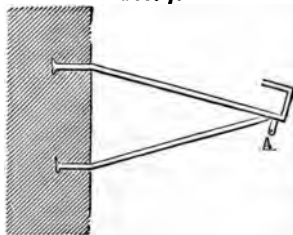
FIG. 6.

*Fan-training, Fifth Year.*

second or third year, instead of laying in all the side shoots at full length, some of them are shortened, so as to get two principal shoots from each, as shown at *b, b*; and occasionally a side shoot may be made to produce three others, as shown at *c*; the object being to cover the walls neatly and regularly, so that the branches of the tree may not appear too crowded in one place and naked in another.

Protecting Wall-fruit Trees.—The protection of the blossoms of wall-trees should now be attended to. Various kinds of materials, from “frigodomo” to cheese-cloth, are recommended for this purpose; but we have no doubt whatever that if walls were so arranged that a really effective coping could be applied to them in the spring, we should secure better crops, and have little occasion for cloth protection, and the ceaseless trouble that it entails. It is a curious fact that even in tolerably well-managed gardens five fruit-walls out of six are unprotected with a coping; and if there happens to be one, it is usually insignificant and useless. Every wall for growing choice fruit should be furnished with a permanent coping of about nine inches deep, as less is useless towards throwing off cold rains and sleet when the trees are in flower, and guarding against frost. Indeed, this coping is by no means enough to do this thoroughly, and therefore a wide temporary coping is the best of all; but even if it be adopted, the permanent projection is desirable for the better fixing of the temporary one. The best temporary coping is composed of tarpauling, nailed on a cheap wooden frame, two feet or more wide, and in lengths of six or eight feet, and fixed by having iron rods inserted under the coping of slate, or tile, or brick, and turned up at the point so as to catch and hold the copings firmly in their place. Of course, those rods should slope downwards, so that the sleet, &c., may be effectually thrown off. Apart from its excellence as a protecting agent, this temporary way of coping is valuable from the fact that when all danger is past, it may be removed,

FIG. 7.



Galvanized iron bracket, more than two feet wide, for placing a few inches under the permanent coping, and supporting a temporary coping of bituminized felt or tarpauling nailed on light wooden frames.

and the trees exposed to the cleansing and healthy influence of the summer rains. If a wide permanent coping were made, the trees would not grow under it, and the top of the wall would be bare of them.

In addition to the coping, it is generally thought advisable to have mats, or a curtain of bunting, or coarse canvas, or nets suspended in front of the wall to protect the blossoms, not only from the frost, but from the equally destructive rays of the sun; and to support this bunting some iron rods should be fixed to the projecting part of the bracket, or hooks should be driven into the lower edge of the coping-boards; but if the wide temporary coping be used under the six inches or so of permanent coping generally projected from the top of garden walls, it will not, except in exposed and unusually cold positions, be necessary to resort to curtains.

Sometimes the blossoms of early fruit-trees are protected by sticking cuttings of evergreens, or cuttings of beech or hornbeam which have retained their leaves, between the branches of the wall tree and the wall, so that the leaves on the cuttings may cover the blossoms on the tree; but this is seldom very efficacious, as, unless it is very adroitly done, many of the blossoms will be knocked off; and besides, it does not protect the branches themselves, though it is equally important to preserve them from the alternations of heat and cold, as it is to protect the blossoms. And again, these branches do not prevent the cold, sleety rains from falling on the trees, and thus prepare them to fall a ready prey to the first frost. The netting commonly used is about equally useless.

Management of the Pleasure Grounds and Shrubbery.—If a shrubbery has been properly planted, there ought to be a sufficient proportion of evergreens to make it almost as ornamental in winter as in summer; and it should be carefully attended to at this season, to keep it neat, and to remove any branches that may have been broken by the snow, or in any other ways injured during winter. The ground should also be forked over, and any suckers that may have sprung up should be removed. The gravel walks through a shrubbery should also be attended to at this season, as they are very liable to be injured by melting snow, or the heavy rains of winter. As soon as the snow is off the ground, and a few dry days have taken off a portion of the superabundant wet, it is thought advisable to roll the lawn and other portions of grass, to take off the roughness that they generally present during winter. Seeds of trees and shrubs are best

sown in this month. The rule for sowing them is to cover them with soil as deep as the seed is thick.

Management of half-hardy Plants in the Flower Garden.—In frosty weather half-hardy plants should be sheltered as much as possible, both from the frost and the sun, as the mischief done by frost is never so great as when the sun is allowed to shine upon the frozen plant. It is like exposing a frost-bitten person to the heat of a great fire. In all cases where plants are affected by the frost, the best thing that can be done is to shield them from the sun's rays; and when the sun has warmed the air, they may be sprinkled with water from a garden engine; but of course this should never be done while the air continues frosty. Watering the plants with cold water is analogous to rubbing frozen fingers with snow; the frozen object parts with its cold slowly to an object only a little warmer than itself, and its particles expanding gradually, circulation is restored. On the contrary, any sudden communication of heat makes the particles expand so rapidly as to tear asunder the vessels in which they are contained.

The choice kinds of Ranunculuses and Anemones may be planted in this month, if the weather be mild and the ground tolerably dry. They do best planted in beds, in drills about five inches apart, and two inches deep. A little sand should be strewed along these drills, and the tubers placed in them, about three or four inches apart. Of course, the anemones and ranunculuses should be kept in separate beds; and in planting the anemones care should be taken that the part of the tuber containing the bud, or eye, as it is called, should be kept uppermost. In planting the ranunculus tubers, the claws should be placed downwards, and care should be taken not to break off any portion of the claws, as when broken the tubers are very apt to rot. Where it is wished to have anemones and ranunculuses particularly fine, a layer of cowdung may be placed over the bed, which should be forked in towards the end of March. It must be observed, however, that there should be at least two inches of loamy soil between the tubers and the cowdung, or the tubers will rot. If the weather is at all dry and warm, the beds should be frequently watered, so as to keep the ground tolerably moist, as, if this is neglected, the flowers will be deficient both in size and colour.

Plant Houses.—General Management of Greenhouses and Conservatories.—Great care should be taken in this month to ventilate

greenhouses properly, as more mischief is generally done at this season by damp than frost. Whenever the air is mild and the sun shines, the door of the greenhouse should be opened as well as the windows, for at least half an hour in the middle of every day, so that there may be a free current of air through the house. All the dead leaves should be removed as soon as they are sufficiently decayed to come off the plant without injuring it; and if any moss or green matter appears on the surface of the earth in the pots, it should be removed, and the earth loosened with a flat piece of stick about an inch broad. It must be observed that what is said of removing the leaves does not apply to bulbous plants, as their leaves should be left on as long as possible. Greenhouse plants require great attention at this season, as they are not only in danger from frost and damp, but also from too much heat, as, if the thermometer is allowed to exceed 45° or 50° , the plants will be weakened, and their leaves will turn yellow. If the greenhouse should become too cold during the night, and the plants in the morning should appear touched by the frost, it is not safe to apply fire heat, but it is better to wait till the house becomes warmed by the sun, and as soon as it is above 35° the plant should be syringed with cold spring water. If the sun should not come out, the windows of the house should be kept close all day, so that the house may become gradually warm. Fire heat is of most use in drying up damp; and when the house appears damp, a fire should be lighted, and the windows opened so as to afford a free current of air through the house, unless there should be a cold piercing wind, which it would be unsafe to admit to the plants. Very little water should be given to plants in pots at this season; indeed only enough to keep them from flagging; and when water is absolutely necessary, it should be kept for several hours in the house before it is used. All kinds of Heath, *Epacris*, and *Leschenaultia*, require very great care in watering, as their roots rot if kept too wet, and wither if suffered to become too dry. In this month the cuttings of soft-wooded plants that were made in autumn are generally transplanted into the pots where they are to flower; and cuttings of almost every kind may now be struck and potted off with great rapidity and success.

Centaurea ragusina has lately become one of the most popular of all flower-garden plants, and deservedly so, for among silver-leaved subjects it has not been surpassed as an ornament to the summer flower garden. It is not a plant of recent introduction, but has been

for many years in cultivation in the interesting botanic garden at Oxford. At last somebody tried it in the open air as a bedding plant, and for a few years past there has been quite a rage for it. As many amateurs fail in propagating it and keeping it over the winter in as great abundance as they could desire, the following remarks on these points may help them :—Early in this month those wanting large stocks of it should be busy inserting the cuttings, for it should be struck in spring, and not in autumn. The best way for the general public to obtain plants from which to take cuttings is to pot those they take from the flower garden in autumn, and pinch or cut their hearts in at the same time. They should be placed in light sandy soil, and in a rather warm and dry greenhouse or pit ; by the month of February they will have pushed out a lot of stubby shoots, and at that time the strongest of these should be taken off and inserted as cuttings. When the best cuttings have been taken off these stumps, they may be allowed to grow away undisturbed, and in a short time another batch will be strong enough to be taken from them, and so on till enough is obtained. Then the old plants may be thrown away, or, better still, allowed to grow into bushy plants and used in May along with the others. Instead of putting the cuttings into pots or pans, as is the custom, a sounder plan is to put one in the centre of each little pot, and then when it strikes root, which it will quickly do, there is no necessity of mutilating the roots, as is the case when things are put in cutting pots and pans. There is too much mutilation of the roots of cuttings carried on. If convenient the pots should be plunged in tan or in a hotbed. This is not absolutely necessary, though thus treated they root more readily. In any case they will of course receive the usual cutting treatment as to shade, &c., for a few days after being inserted, especially if put in somewhat late in the season. The sun we get in February is rarely too strong for cuttings of any kind. The foliage should not be wetted more than is necessary. When rooted they must be gradually “hardened off” by being put in frames and cool houses, and eventually, when the weather is fine enough, in the open air, and in shallow cradles or frames that can be protected if there be any danger. Should there be any strong old specimen plants to spare, their shoots will of course make capital cuttings, and if put in heat so late as April, be fit to plant out the first week in June. Some people who wish to be sure of cuttings from this plant keep specimens in pots all through

the summer, and it is a good plan. These never make a rich luxuriant growth like the specimens planted out, and are therefore much better suited for affording cuttings. Planted out, this species loves a light, rich, and well drained soil.

Tricolor-leaved Pelargoniums.—These plants, commonly but incorrectly called geraniums, have of late become so very popular and so wonderfully attractive from their remarkable variegation, that the following remarks on breeding, growing, and increasing them, by Mr. Shirley Hibberd, in the *Field*, cannot fail to be of use, as every owner of a greenhouse or pit cultivates some of these plants.

A fine large specimen of any one of the more richly coloured tricolor-leaved geraniums presents as remarkable a combination of colours as we shall discover in all the vegetable kingdom. That amateurs who love plants should go crazy about them—that the plant trade should find in them the means of turning over thousands, ay, tens of thousands of pounds—and that a special exhibition for these geraniums alone should have been instituted at Kensington, are matters that actually drop into the region of the commonplace when we look at the plants, and note how far they transcend in splendour all that has been said and done in their honour. The writer of this has raised a large number of tricolors, and carefully studied all the steps and stages of the process. This he mentions in order to show the right to offer his opinion that they have been improved up to the highest point possible consistent with their nature and our notions of beauty. New and beautiful sorts will of course appear from time to time; but distinct, bold, and valuable advances on the best varieties already in our possession are not to be expected. Every one who has bred this class of plants must have observed the tendency in the seedlings to revert to the type of Mrs. Pollock; and at any exhibition of them it will be found that a large proportion of all the golden-edged varieties are but modifications of that most famous of all, but now superseded variety. Perhaps a word as to breeding may be useful to some of our readers. It is bad practice to breed variegates in and in; it is, on the other hand, the very best possible practice to make the seed-bearing plant a common dark zonal, with stout, round, smooth-edged leaf, and to take pollen for fertilizing it from the highest coloured tricolors and variegates you have. Such sorts as Mons. Barre and Mme. Vaucher—in which the leaf is round

and stout, and has a fine dark zone, make better seed-bearing parents than any tricolors. In selecting for pollen parents, we must undoubtedly have well-formed leaves if possible, but colour is of the utmost importance. Our advice to all breeders is to get away from the Mrs. Pollock type as much as possible, for the leaf has an objectionable lobe, and is much notched. Such as Sophia Cusack and Sophia Dumaresque are the kinds to take pollen from, for their colours are splendid, and the leaves are beautifully formed. Those who are of an experimental turn will cross them all sorts of ways, and keep records of results. All we can say, as the results in the concrete of hundreds of experiments, is this—that the same rule holds in breeding for leaves as in breeding for flowers, viz., the plant which furnishes the pollen has more influence over the colour; the plant which furnishes the seed has the most influence over the form.

As to the use of the tricolors as bedders, it is pretty practice, but must be kept within proper limits. For distinct effect in large gardens they are the worst of all leaf plants for bedding. But for mosaics, to be looked down upon by discriminating eyes, they are delightful, and we believe no one could get tired of them all the season through. We have planted out collections in small beds all over our trial ground, solely to put to the best test possible the several varieties, and we could not even in the busiest time resist visiting them daily; it was as if the Alhambra at the best had been but a poor imitation of nature's work, and that there must have been tricolor geraniums prior to A.D. 1250, when the Alhambra was built.

The best possible use for every tricolor known is to be grown as a pot plant. A certain few are good as bedders, but, as remarked above, less effective in masses than the variegated kinds that are less distinctive in their zones, or are destitute of zones altogether. But, whether grown in pots or beds, they are so far delicately constituted that they must have a mellow, nourishing, very sweet, and kindly soil. Rank manure will produce a gross green growth. Poor, sticky, starving stuff will not do; at all events, the plants will make no growth in it. Good light loam, with liberal additions of thoroughly rotten hotbed manure and the very best leaf mould, is the right stuff for all the golden-edged sorts. Sand must be added at discretion. For the silver-edged sorts, less manure and more sand should be used. Experience has taught us that when

the silver zonals—or silver tricolors as they are commonly called—are planted out in rich soil, it gives them so much vigour as to render their zones black, which of course is ruin to the warm, sparkling, silvery effect required. It is true that the golden zonals have blacker zones when in rich soil; but then their yellow margins are brighter, and their tones of red stronger, and the black is thereby overpowered. Hence we may lay down the rule that the golden zonals should have a more generous soil than the silver zonals, and that neither class should be planted in soil which could be justly described as rank. In a wet summer all the delicate-habited varieties do better in raised beds than on a level; in such a summer as 1868 plants on raised beds were more likely to die than live, but in any case they will delight in a light, deep and rich soil.

There has been much said and written about the propagation of these plants. At great nurseries, where they are largely grown, the whole of the plants are struck under glass with the aid of gentle bottom-heat, and the propagating goes on nearly the whole year round. The Donnybrook rule of "wherever you see a head," &c., is the basis of the practice; so a tricolor grower would say, whenever you can take a suitable shoot, cut it. For the benefit of ten thousand amateurs who do not wish to propagate tricolors by the million, and who will not make much fuss about it, we may say that every one may be struck in the open border in just the same way as we strike Tom Thumb, only we must allow a longer time and take a little more pains over it. A border should be made for the purpose by digging in plenty of the sharpest sand and the best leaf mould. A screen should be made for it by means of a few laths and calico, or a few old frame lights will do, to be supported by posts or chimney pots. Put in the cuttings in the first week of June; put the screen or light over during fierce sunshine, say from eleven to three, for the first fortnight; and every evening sprinkle the tops of the cuttings lightly by means of a syringe. At the end of a fortnight take away the screen, and do nothing more for them than to give sufficient water. Take them up and pot carefully about the middle of August. This plan will ensure strong, well-rooted plants, every one of which will be worth three plants of the same age raised under glass.

In selecting varieties preference should undoubtedly be given to *colour*, as more important than *form*. But we want the best *form*

possible—a margin without lobes and notches, and with no break in its continuity where the stalk is placed. Usually we see there a cleft more or less wide; in a perfect leaf it is difficult to trace where the stalk is. The first-prize variety, Mrs. Grieve, at the Kensington Exhibition of 1868, is probably the finest in form of leaf of all the varieties known; but for our taste the zone has too much black in it. If we do not have splendid colours in these varieties, why should we have these varieties at all?

In selecting novelties, we should first secure, as the finest golden zonal in existence, Achievement, raised by Stevens. It is a small-leaved variety, remarkable for its splendid tones of red; it shows scarcely a trace of black, and the yellow margin is as sharp and clear as if laid on by an enameller. We can not only recommend this as wonderful in colour, but we have seen it growing out of doors, and its behaviour was such that we feel assured it will be a first-rate bedding plant.

Another splendid gold zonal is Mrs. Turner, a most vigorous-growing plant, with intense colours, pure and lasting.

Ettie Beale is a most brilliantly-coloured kind, the form very nearly perfect, and the growth neat and compact.

Amongst the silver zonals, the best no doubt is Miss Burdett Coutts.

The amateur who speculates in the newest and grandest must also have Banshee and Excellent for their purity of colouring and free vigorous growth.

The following lists comprise the twelve very best of the cheaper kinds in both classes. Those marked thus * are the best among the best:

Gold Zonals (Golden Tricolors).—Jetty Lacy, Lady Cullum,* L'Empereur, Louisa Smith,* Lucy Grieve,* Miss Watson,* Mrs. Pollock,* Sophia Cusack, Sophia Dumaresque, Sunset, Titania, Queen Victoria.*

Silver Zonals.—Banshee,* Beauty of Guestwick, Caroline Longfield,* Countess, Glen Eyre Beauty, Impératrice Eugénie, Italia, Unità,* Light and Shadow, Princess of Wales,* Queen Victoria,* Silver Star, Wassand Hall Beauty.

The Vinery.—This is a very good time to commence forcing; and if the vines have wintered outside, they should now be taken back into the house, and the rods should be trained to the rafter. Before applying any fire heat, the holes through which the vines are in-

roduced must be stuffed up on each side the stem with hay or tow, so that no space is left through which the cold air can enter. The lower part of the stem and collar of the vine should be well wrapped round with hay-bands; and a coating of stable manure, litter, or leaves, a foot thick, should be laid on the vine border, so as to prevent the possibility of frost reaching the roots in the open air. When fire heat is first applied, the thermometer should be at 55° at night, and at 60° or 65° during the day; but the heat should be gradually increased as the buds begin to swell. When the forcing of vines is commenced in February, the grapes will be ripe in July and August.

Garden Enemies.

Quadrupeds.—*Mice* are very destructive to gardens about this season, as they attack the corms of the crocuses, and other similar plants. There are two species of mice which are found in gardens, viz., the long-tailed garden or field mouse (*Mus sylvaticus* Linn.), and the short-tailed meadow mouse (*M. agrestis* Linn.); and these creatures, which lay up a store of food, consisting of beech mast, acorns, &c., with which to maintain themselves during the winter, become perfectly ravenous when their winter store is exhausted (which it generally is about this season), and very destructive in gardens. Traps should, therefore, be set for them in different parts of the garden, as they are more easily caught at this time than at any other period during the year. Hares and rabbits still continue their depredations; and, therefore, the means recommended last month should again be resorted to, to protect plants and fruit trees.

Birds.—*Bullfinches* and *tomtits* commence their depredations in the gardens in this month. As soon as the buds of the trees begin to swell, they are attacked by the bullfinch, an insidious plunderer, as Knapp calls him, who will destroy every bud on the gooseberry bushes if he is permitted to do so without being disturbed. The tomtits attack the buds also at this season; and though they are said only to be in search of insects, the number of buds scattered at the foot of the trees where they have been, shows the mischief that has been done.

Insects.—The *coccus* insects are some of the most troublesome and destructive that are found at this season. There are various

kinds of coccus or scale insects, which assail hothouse and greenhouse plants, and those in the open air. These insects are only injurious in warm weather, as during the winter they are in a torpid state; but it is in the winter that they are most conspicuous, and, therefore, most easily destroyed. The female, when she has laid her eggs, dies where she has attached herself to the branch, so that her body forms a kind of tent to protect her young. The dead body of the female coccus, however, is so firmly fixed to the branch that it merely looks like a swelling in the bark, and no one unacquainted with the habits of the insect would suppose that it served for a nest. When these swellings are observed, they should be scraped off with the bone-handle of a budding knife, or brushed off with a dry brush; and the branch should be afterwards well washed with plain water. Many compositions are recommended to destroy the scale, but most of them injure the trees as much as they do the insects. When plants are very badly infested with scale insects it is hopeless to expect to make them healthy or even presentable. When the plants will bear cutting down, it is better to cut them down, and then thoroughly scrub and clean every particle of the remaining bark, so that all the eggs may be removed. It is even better when plants are covered with scale, as the Oleander plants in some gardens are, to burn or otherwise destroy the plants, and begin afresh with perfectly clean young plants or cuttings. Green fly will begin to work and multiply strongly at this season, and must be destroyed the moment it is observed; it is surely better to destroy the pest before instead of after the damage has been done.

At this season, too, as well as at many others, a little white fly, a species of *Aleyrodes*, may begin to be very troublesome in the houses and pits. It is comparatively a new addition to our garden foes, and even more troublesome and difficult to eradicate than the green fly. It seems particularly fond of *Lantanas*, *Salvia splendens*, *Fuchsias*, and various other soft-wooded plants. If when badly infested a plant is touched or brushed over with the hand, the pretty white little flies rise in a cloud, but soon settle down again to their work. Good and repeated fumigation is the only remedy. Profuse but gentle syringings of all the surfaces of the plants would tend to subdue it. Some have found fumigation with old cigar ends efficacious in destroying this pest.

MARCH.

General Observations and Directions.

The Weather, &c.—The weather in March is very uncertain. Frequently there are a few warm days, which are succeeded by a sharp frost. Occasionally also, a warm day, which, when the sun is shining, might almost be termed hot, is succeeded by a frosty night. Weather of this kind is extremely trying to plants, and hence a great deal of care and attention is required from the gardener during this month. This month is also celebrated for its cold drying winds, which have a most injurious effect on vegetation, as they occasion more rapid evaporations from the leaves than the roots can readily supply; and whenever this is the case, the leaves must necessarily appear withered and drooping, and the plant cannot be in a healthy state.

Open Garden.—This is a busy month in the garden, particularly in the kitchen garden, when the weather is fine. It is the month of all others for seed sowing. Some time during the month the following should be sown, and the successional crops, like peas, &c., twice during the month; the hardiest of the annual flower seeds; in the kitchen garden, York or early Battersea cabbages and savoys, asparagus if it be desired to raise young plants of it, asparagus-kale, borecole, Brussels sprouts, cardoon, carrot, cauliflower, celery, small salads, leeks, onions, parsnips, peas, and beans; rampion salsify, and scorzonera, spinach, turnips, and lettuce. A little red beet may also be tried, and, of course, successional sowings of the various small saladings, &c. Prick out celery in a forward state in pans on a slight hotbed, or on six or eight inches of rotten or half-rotten stable manure, surrounded by a rough board or a line of bricks in the melon yard or some by-place. Cover the young plants pricked out at a few inches apart with hand-glasses, which may be removed by-and-by, and then the plants taken with large balls to the places prepared for them. Cauliflowers, lettuces

raised in frames, &c., should also be planted out. Keep rhubarb covered with boxes, pots, or tubs, to draw it up tender and quickly. Make new plantations of asparagus, and put the young plants in the beds that have been prepared for them during the autumn or winter. Clip holly hedges, and finish the pruning of all flower-garden shrubs, climbers, &c., removing all decayed growth, and also all traces of the winter's ravages. Weeds will begin to look up rather vigorously, and should be exterminated by hoeing and stirring the ground during suitable weather. Sow lawn-grasses in showery weather. Finish all nailing, &c., out of hand at once. In a well managed garden all such work should be finished ere this. In the pleasure grounds and flower garden everything should now be made as trim as possible, lawns and walks rolled, beds not occupied by spring flowers turned over and otherwise prepared for bedding plants. New beds or borders should be made if requisite, and old ones renewed by having some of the exhausted soil taken out and fresh rich loam and manure put in, but this kind of work is much better done in autumn. However, few can do everything at the right time, and he who knows how to manage a garden will not be deterred much by the date.

Every place in the neighbourhood of the spring flowers that will now be coming in, should be kept as neat as possible, so that we may fully enjoy them; and when bulbs and Hepaticas peep from clean fine level ground, a very different effect is afforded to what is seen when they appear on the rough wintry surface of the flower garden, too often neglected by your modern gardener till he thinks of putting out his tenderlings in May. Herbaceous plants, &c., may now be removed without injury. Young stock of the hardier bedding plants, such as *Viola cornuta*, *Campanula carpatica*, hardy, silvery, and variegated plants, may now be placed in the positions they are intended to occupy. Plant out layers of pinks and carnations made last year where they are to flower. They will get nicely established in good time; and it will to some extent lighten the labour when all the tender things begin to be put in the beds.

If fruit tree borders have been prepared during the winter, the young trees should be carefully planted now; but whether they be planted now, or any time during the past half year, it is a good precaution against the drying winds of March to cover the roots with littery manure, which will benefit them till they have caught

firm hold of the ground. If you are much troubled by the gooseberry caterpillar, lay a thickish layer of tan under the bushes, which will act as a preventive, and may be dug into the earth at the general digging in autumn.

Indoor Department.—In this department there should now be as much bloom as at any season of the year, the great majority of camellias, and the more important greenhouse plants, coming in now with the forced flowers. For adding high beauty of form and pleasing verdure to the larger class of conservatories and show houses, nothing can surpass nice young specimens of the Norfolk Island pine, except it be well-grown specimens of its congener, Cook's Araucaria, and amateurs will be glad to learn that they succeed admirably in the sitting-room. These should be in every large conservatory, the symmetry of the former and the feathery grace of the latter being extremely telling.

Among the pot plants, growth will be so vigorous at present that potting will be the order of the day; and in cases where it may not be performed, things about to flower, or placed in the largest pots which it is intended they should obtain, may be much benefited by occasional doses of clear and weak manure-water,—that of sheep-manure being the safest. Those interested in the culture of indoor fruits may with great advantage turn their attention to the fig as a pot plant. It does much better in pots than any other fruit, bearing freely, forming nice little manageable bushes, and thus affording the best means of getting a great variety of this excellent fruit very early in and throughout the season. Peaches, nectarines, &c., are certainly better when planted out and grown in a fully developed condition in a house, and though the fig may be cultivated to the greatest perfection in like manner, it will still be found the best plan to grow the fig in pots even for large places. Early vineries now require constant attention, rubbing off all superfluous shoots, and stopping fruiting ones a joint or two beyond the young bunch or flower. Such, if planted inside the house, should have a good soaking of water now and then. Grapes should be thinned when in a small state, and well thinned too. It requires some courage and experience to thin them sufficiently, and with amateur gardeners they are rarely more than half thinned. It should be done when they are about the size of radish seed. Some leave them till the scissors can hardly be got between the berries without hurting them. Vineries now being started should be shut up early—say

three o'clock—and syringed, so as to conserve some of the valuable heat of the sun, and a genial moist atmosphere in the house during the afternoon. The orchard house, which should have been a gay and pleasant retreat for some time past, should now above all other houses have abundance of air.

In the forcing-house give abundance of air to strawberries, keeping them near the light and well attended to with water. Potatoes, lettuces, &c., now being forced in frames, should have not only “abundance of air on every favourable occasion,” but be completely uncovered during fine days. In cucumber and melon pits, preserve a heat of from 75° to 80° , or 10° more with sunlight. In such beds will be found the best places for growing young tomatoes, egg plants, capsicums, &c. Sow vegetable marrows, citron gourd for preserving, and ridge cucumbers.

Dahlia roots should now be looked to, and a place in a pit or frame with bottom heat soon devoted to starting them. The potting off of bedding plants, and the propagation of the freer growing kinds, should now be attended to. In frames and temperate hotbeds, such tender plants as primulas, balsams, cinerarias, &c., for autumn blooming, and also numerous things used for planting out in the summer flower garden, should be sown now, and those sown a few weeks ago should be potted off. If you have a choice strain of Chinese primula, and wish to save seed, you will do so much more effectually by gently seizing both sides of the flowers that have arrived at their full development, pulling them from their base, and then backwards and forwards three or four times, finally taking off the flower and throwing it away. This movement causes the pistil to pass several times through the well-laden stamens, and thus get covered with pollen. The pods will soon be crammed with seeds instead of hollow, or with but a few seeds as is commonly the case. Such things as polyantheses, ornamental grasses, perennials of various kinds, and hardy things generally, may now be sown in pans or pots and placed in cold frames.

Things not to be done in March.

In grafting apples, pears, plums, cherries, &c., at this season do not use the filthy, troublesome, and time-honoured composition of clay, cowdung, &c., recommended in all our gardening books, but

procure some of the French cold grafting mastic, of which an excellent kind is sold by Messrs. Hooper & Co., of Covent Garden, under the name of *Mastic Homme Lefort*. It is sold in small canisters, may be put on by means of a blunt stick or knife, and by its means a lady or gentleman may practise the interesting art of grafting without any inconvenience, which was very far from being the case when we had nothing but the old and clumsy mixture.

In planting horseradish never place the crowns near the surface of the earth as usual with most other roots, but in the bottoms of trenches from fifteen to eighteen inches deep.

Never leave that excellent vegetable the Jerusalem artichoke to chance, as is not uncommonly done, but give it an open position, and make a fresh plantation every year, planting the tubers in lines a yard apart, and eighteen inches apart in the rows.

Never sow radishes and small saladings in comparatively large breadths, but adopt a system of sowing very little at a time, and sowing every ten days thus ensuring a succession of tender saladings. For want of this attention and also of sufficient water, radishes at British tables are barely eatable, especially to persons who have eaten them on the Continent.

Never keep the lights on pits or frames planted with early potatoes in the daytime when they may be exposed, and even when the weather is very severe use every means to give them air.

Never plant fruit trees or deciduous trees or shrubs after the early part of this month.

Never expose half-hardy plants, that have been protected through the winter, suddenly to the full power of the sun, so as to excite them too fast; as, if they expand too rapidly, late frosts may injure them: uncover them gradually; and if they have been injured by frost, keep them shaded until the buds break.

When woody plants are repotted, take care that they are not placed deeper in the pot than they were before.

Never pot any plants when the soil about their roots is very dry; water them first so as to soak the ball of earth.

Never sift soil for rooted plants of any description; for the surface of seed pots and for cuttings it is desirable to sift it.

Never sow seeds or insert cuttings or pot plants in dirty pots, or the roots may take hold of the dirt-encased sides so firmly that they may be mutilated in the process of turning them out of the pots.

Never take off more leaves from cuttings than is necessary for inserting each cutting in the soil.

Never use any mode of protecting fruit trees with branches, nets, &c., none of which keep away the cold and sleety rains from the fruit, while you can use the wide temporary coping elsewhere recommended.

Never pinch the shoots of vines at one or two joints beyond the bunch as is now the common practice throughout the country. Allow them to make from three to five joints or even more if there be room for the shoot to develop, and increased vigour and health in the vines will be the result.

Never cover flower-seeds sown in the open border with rough sticky earth, but have a barrow full of finely sifted earth at hand wherewith to cover them according to size.

Never sow flower-seeds in borders or beds broadcast, but in borders always in a circular drill, or if in beds in parallel lines. The advantage of sowing in a ring or in drills is, apart from convenience of thinning, that you can more readily distinguish the weeds from the plants, and easily destroy the former.

Principal Operations in March.

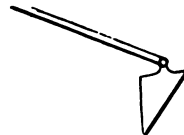
Ridging out Cucumbers and Melons.—In this month the seedling cucumbers and melons are transplanted, either into the soil in the bed where they were raised, or into a larger bed prepared for them. This bed is made nearly in the same way as that for raising the seeds, but the manure is generally heaped up till it is about three feet and a half high. In about a week or fortnight after the bed has been made, the earth should be laid on two or three inches thick all over the bed, and in a little hillock ten or twelve inches high in the middle of each light. In two or three days the earth in the hillocks will be thoroughly warm; and when this is the case, they should be levelled a little, so as to be only about eight or ten inches high, and they are then ready to receive the plants. The pots containing the cucumbers or melons must be examined; and, if the plants are in a healthy state, they must be turned out of their pots and planted in the following manner. The gardener places his hand on the surface of the earth in the pot, taking the stems of the plants carefully between his fingers; he

then turns the mouth of the pot downwards, and strikes the edge of the pot against the frame, when the plants will come out with their ball of earth entire. A hole must be made in the middle of each hillock, and the contents of one pot with the ball entire being placed in each hole, the earth is closed in round and over the ball close to the stems of the plants. This is called ridging the plants. A very slight watering is then given, and the glasses are shut down close for an hour or two, when they are opened a little behind to let the steam which has arisen escape. It must be observed, that both cucumbers and melons are naturally climbing plants, and that if they were left to nature, the main stem would grow two or three feet high before any lateral or fruit-bearing shoots were produced; but when the plant is deprived of the bud of its main shoot, it immediately begins to form lateral runners, which in ten or twelve days will probably form blossom buds. It is therefore necessary to pinch off the point of the leading shoot, as soon as the plant begins to grow, and this is called stopping the main shoot. The side shoots, as they are produced, should be trained regularly over the bed, and should be stopped one joint beyond the fruit as soon as it makes its appearance. All weak and badly placed shoots should be removed. Cucumber plants, sown in February and properly treated, will produce cucumbers in the latter end of March or in the beginning of April; but melon plants raised in February will not produce fruit till May or June.

Making Asparagus Beds.—Asparagus beds should be placed in an open situation, where they can have the full advantage of the sun. Each bed should be four feet and a half wide, and the alleys between the beds should be two feet wide. Previously to marking out the beds, a coating of rotten manure five or six inches thick should be laid on the ground, and the ground should then be trenched two feet deep, and the manure dug in, contriving that it shall be buried from a foot to eighteen inches below the surface of the ground. As soon as the beds are ready, a sufficient quantity of asparagus plants should be procured from the nurseryman, or they may be raised the year previous by sowing the seed in March in a bed of rich earth. When raised at home, the asparagus plants should not be planted till the roots have commenced growing, which will be about the middle or latter end of April, and the beds need not be made till the beginning of that month; but when the plants are procured from a nurseryman, they are never in a growing

state, being purposely kept in a state of repose as long as possible, to prevent them from being injured by the length of time they are likely to be out of ground when they are removed. The plants are considered best when they are only one year old, and they should never be more than two years old when asparagus beds are planted. Great care should be taken, both in taking up and keeping the plants, to prevent their roots from being exposed to the air; and it is best to keep the plants in a hamper or basket, with a little earth thrown over the roots. It must be observed that the plants, when in a proper condition for planting, appear to consist entirely of roots. The usual mode of planting is to stretch a garden line along the bed about nine inches from the edge, and then with a spade or the drill-hoe (fig. 8) to make a small trench, close to the line, six inches deep, along which the plants are to be placed twenty inches apart. The ground is then filled in, and another trench opened in the same manner till each bed has four rows of asparagus plants in it, the two outside rows being nine inches from the edges of the bed, and the other two between them at regular intermediate distances. The latter end of the month, the old beds of asparagus should be what gardeners call "spring dressed" by removing their winter covering, and then slightly loosening the surface with a fork, and raking them.

FIG. 8.



The Drill-hoe.

Potatoes and Artichokes.—To secure potatoes fit for table it is necessary to plant early; plant sufficiently wide apart to allow the haulm to spread without crowding, and to allow the sun to warm the soil and ripen them properly. Ground rank with manure will produce heavy crops, but the potatoes will be waxy, and if disease breaks out they will suffer greatly. Moderate manuring is desirable if the ground is not in good heart. The best way to prepare seed for planting is to spread it out on the floor of a barn or shed where there is plenty of daylight; or if several sorts are to be grown, place the seed in baskets or boxes, or dispose of them so that they are exposed to the light, and can be conveniently removed when needful, without knocking them about. If they grow in store they make long, weak, wasteful shoots; but if sprouted in the light the shoots are short and hardy, and in the operation of planting do not get broken. In the field the dib must be used perhaps, but it ought never to be allowed in gardens, where potatoes should be

trenched in, not dibbed. If there are signs of a change of weather coming when potatoes are nearly ripe, take them up and store. You may save your whole crop by planting at early worm, and if the tubers are full grown, they will ripen after they are stored.

The true ashleaf kidney, milky white, king of the potatoes, and York regent, are among the best potatoes that can be grown by the amateur.

Jerusalem artichokes are planted in this month by sets or small tubers in the same manner as potatoes. The universal potato has furnished so many disappointments during the past twenty years or so, that substitutes have been looked for everywhere, and we have had a variety of things offered, from the Chinese yam to the roots of oxalises. Now not one of these, taking all things into consideration, has ever approached in value this neglected old plant, frequently thrown to live as best it may in some corner devoted to weeds and rubbish, in some useless spot under trees, or where anything less delicate than couch grass would refuse to grow.

To many it may appear very inferior to the potato in its nutritive qualities, but analysis has proved that it is so in but a slight degree; and the potato must be in its best condition to be more agreeable than a properly cultivated and prepared dish of the artichoke. Where the slightest knowledge of cookery exists there can be no difficulty in serving them up in an agreeable manner: and it would be a boon to the poorer classes of cottage gardeners if this vegetable, and some simple but agreeable mode of serving it, were commonly known amongst them. To the country gentleman the vegetable should be additionally useful from the fact that pheasants are fond of the tubers, and that it would form a strong and dense herbaceous covert.

A native of Brazil, and not of Jerusalem—not at all a true artichoke, but simply a perennial and tuberous species of sunflower, the name "Jerusalem" in this case being a corruption of the Italian word "girasole"—it possesses a constitution superior to that of any other vegetable we grow. It grows on any soil, and no matter in what way planted and managed: and perhaps that is the reason why we rarely see it exhibit the perfection found in other vegetables. "It is only the Jerusalem artichoke; it will do anywhere." And "anywhere" it is often left—a few being dug up occasionally when wanted, just as in a country garden they resort to an ancient bed of horseradish. But the more vigorous a plant is, the more is it liable

to become rapidly overcrowded, and consequently deteriorated; and, though artichokes and horseradish may be grown anywhere, yet there is a very wide difference between specimens cultivated and those "left to nature." In the last case the Jerusalem artichoke produces an abundance of contorted tubers, which, though good in their way, are very inferior to the large roundish tubers furnished by the plant when cultivated.

To say that it likes deeply dug or trenched sandy loam, and an open situation, is to say that it has the same taste as most vegetables; but, being so vigorous a rooter, it will be well to encourage it with deep soil, if that be convenient. It is readily propagated and planted by inserting the smaller-sized tubers five or six inches deep in the ground, in rows a yard apart, and eighteen inches apart in the row, the lines to run north and south, to admit the rays of the sun. They will remain through the winter in the ground safer than anywhere else, though it is better to guard against the necessity of digging them out of frosty ground by storing some in sand. It is essential that a fresh plantation be made every year, and the crop dug clean out, as all bits left in will push and be troublesome.

Sowing Culinary Vegetables.—The ground intended for culinary vegetables should be dug over or trenched, and manured if the soil be poor. It should then be divided into beds about four feet and a half wide, with alleys from a foot to two feet wide left between the beds. Turnips, carrots, parsnips, and beet-root should be sown in light sandy soil, as should the seakale when raised from seed. The kind of turnip usually sown in March is the early Dutch, and the turnips will be fit for use towards the end of May. The main crops for winter use are not sown till August. In dry weather turnips should be frequently watered, as otherwise they are subject to mildew and the attacks of insects. The turnips would also become tough and stringy without abundance of water. The seed should be sown in drills a foot apart, and the plants thinned out to six inches' distance in the row. For a bed of the ordinary size ($4\frac{1}{2}$ ft. by 24 ft.), about half an ounce of seed will be required, and the young plants will appear in a week or ten days, according to the season. The soil should be good, thoroughly pulverized, and well drained. If the land be at all stiff or moist, the seed should be sown on raised drills. Turnip seed is said to keep good four or five years. The carrots sown in March are generally the early scarlet horn, and the long orange or Altringham; the first for summer

use, and the latter to keep during winter. The seed should be sown in drills nine inches apart, and the carrots thinned out when young till the plants are left six inches apart, if the carrots are required to be only of the ordinary size; but if it is desired to have them very large, the drills should be eighteen inches apart, and the plants after thinning should be from eight to ten inches distant in the row. As carrot seeds have numerous forked hairs on their edges, by which they adhere together in clusters, they should be rubbed between the hands and mixed with dry sand, in order to separate them as much as possible before sowing. For a bed $4\frac{1}{2}$ ft. by 30 ft., the plants to be thinned out to six inches every way, or for 150 feet of drill, one ounce of seed will be requisite. The seed does not come up for four or five weeks in spring, and for three or four in summer and autumn. The soil, though light and sandy, should be deep and rich, in consequence of having been well trenched and manured the preceding year; but fresh manure should never be applied to carrot beds, as when it is, the carrots are generally deformed or scabby. Carrot seed should always be fresh, and it generally grows with difficulty if more than a year old. Parsnips are biennials: the seed is sown in March in rows eighteen inches apart, and the plants are afterwards thinned out so as to be left eighteen inches apart in the row. There are very few varieties, but the hollow-crowned is generally considered the best. As the roots are not injured by frost, they are generally left in the ground till they are wanted. As the seeds of this plant do not keep longer than one year, and as, when bought in the shops, old seeds are often mixed with the new ones, it generally takes an ounce of seed to sow an ordinary-sized bed, as a great number of the seeds do not vegetate. The plants come up in eight or ten days after the seed is sown.

Parsley seed should be sown the first week in this month, either broadcast or in rows. An ounce of seed is generally sufficient for a tolerably large garden. Radishes, lettuces, and spinach, are also sown by preference in light soils, and the seeds for a crop of each of these are generally sown the first week in March, and successional crops sown every ten days or a fortnight till the end of May. The soil for radishes should be well pulverized at least eighteen inches in depth. The seeds are generally sown broadcast in small beds, and they should be scattered so that the plants may be an inch and a half or two inches apart. For a bed four feet six inches by

twelve feet, two ounces of seed will be required; and the plants will come up in eight days. The common and short-topped scarlet are the sorts most generally sown at this season for the long radishes; and the white, rose-coloured, and yellow, for the turnip radishes. Radish seed will keep two years. Cabbage lettuces are generally sown for the early crop; and the best kinds to be sown at this season are the Marseilles and Malta, both of which are large-growing varieties. The Imperial, Grand Admirable, and Large White are also excellent summer cabbage lettuces; and the Grand Admirable has the advantage of growing a long time without running to seed. The seed is small and light, so that for a small bed, ten feet by four feet, a quarter of an ounce is generally sufficient, as it will produce about four hundred plants. The seeds will vegetate in ten days or a fortnight, and as soon as the plants show their third leaf, they should be thinned so as to leave them six inches apart. The first sowing of the cos lettuce is generally made the first week in March; and the best kinds are the white, the black-seeded Egyptian cos, which does not readily run to seed, and which will bear dry weather without its leaves becoming tough, and the Paris cos. The soil should be deep, light, sandy, and rich; but it should not be freshly manured, or if it is, the manure should be buried in a deep trench. In dry weather lettuces should be frequently watered, or they will not be succulent. Lettuce seed will keep good three years. The spinach sown in March is generally of the round-seeded variety, and it is best sown in drills nine inches apart, and the plants, when two or three inches high, are thinned to be six inches apart. About an ounce and a half of seed is sufficient for an ordinary-sized bed ($4\frac{1}{2}$ ft. by 24 ft.), and the plants appear in about a fortnight. Summer spinach is often sown alternately, with rows of peas or beans; but as the spinach is generally more or less shaded by these crops before it is fit to gather, it is never of so good a quality as that which is sown in the open garden. Spinach seed will keep good four years.

Onions and leeks require a soil richly manured. Charcoal is also beneficial to these crops. The time for sowing the main crop of onions is the middle of March; and perhaps the best kind is the Reading—of which Sutton's Improved Reading variety is the best. James's keeping is the best onion for late spring use. The ground should be well dug over to a considerable depth: and an ounce of seed is required for a bed four feet by twenty-four feet, if the onions are to remain in it till they are full grown. The seed should be

sown in shallow drills nine inches apart, and then covered with soil from about a quarter to half an inch thick. When very large onions are required, they should be sown in drills a foot apart. Sometimes the seed is sown quite thickly in August, and the bulbs are transplanted in March into rows from nine inches to a foot or eighteen inches apart, according to the size which the bulb is expected to acquire, great care being taken in transplanting to keep the whole of the bulb above the ground, and only to let the fibres go into the soil. Onions thus treated attain a large size, and produce a uniform crop without the trouble of thinning; and the onions are ready some weeks sooner than the crops sown in the ordinary way in March, but the transplanted onions are rather apt to run to seed. For autumn sowings the Tripoli onions should be preferred. The potato onion and the bulb-bearing onion are generally planted in February or March in shallow drills about a foot apart, the point of the bulb being left above ground. Leeks are generally sown thinly in small beds four feet wide. In June they ought to be planted out in trenches, prepared somewhat like celery trenches, the plants about six inches apart in the rows, and the rows or trenches about twenty inches apart. If not put in manured trenches, a very rich soil and plenty of manure water will be desirable. For the seed-bed an ounce of seed will be sufficient. The seed should be sown broad-cast about the middle of March, and it will come up in a fortnight. The cloves of the shallot and garlic are generally planted in this month, and they should be treated like the bulbs of the potato onion.

Cabbages for the autumn crop are sown in March, and one of the best kinds is the Vanack, as it is always in season, and as it sprouts freely from the stem after being cut; the sprouts indeed form such good heads that one plantation of this kind of cabbage might supply an amateur gardener with cabbages for a whole season. Among cabbages, the Battersea is very good for summer use; Aitkin's Matchless is also fine; the Rosette Colewort is the best to sow in May for autumn and early winter use; Green Curled Savoy and Early white Savoy are also good. The cabbages sown now should be transplanted in May or June; the seeds of cabbages for the main crops are sown in July and August; under the first of which months directions for sowing them will be given. The seeds of the dwarf green Savoy and of the Asiatic cauliflower may also be sown in March. Those fond of Savoy cabbages should not forget

to sow the early *Ulm* during the first week of this month ; planted out at twenty inches apart, they come in in early autumn, and are very well-flavoured and useful. Peas for the summer crop should be sown in the beginning of this month ; and they are always sown in rows, for the convenience of sticking and earthing them up. Peas have very slight roots, and as they do not take firm hold of the ground, they require to be earthed up, to keep them upright ; the sticking is for the same purpose, as the pea is a climbing plant, with stems too weak to grow erect without some kind of support. The early sorts are better sown pretty thickly, and the tall vigorous sorts thinly. In very dry weather peas require abundance of water if it can conveniently be given them, and they are very much the better of being mulched for two feet on each side of the line with half decomposed manure. This is especially desirable for the summer crops. Peas are best when grown upon a light soil ; when the soil is stiff, the peas generally become tough in boiling, instead of tender. The best peas for the amateur are Sutton's Ringleader or Carter's First Crop, M'Clean's Little Gem, Champion of England, Veitch's Perfection, and King of the Marrows. Beans grow best on a stiff soil, and the kinds usually sown in March are the Mazagan for the early crop ; and the Windsor, the Early Long-pod, and the Dutch Long-pod, for the main crop. A quart of seed will sow a drill of 120 feet in length. The plants come up in a week or ten days after sowing, if the weather be warm. The drills are generally two feet and a half or three feet apart, and an inch and a half or two inches deep. Sometimes a garden line is stretched along the bed, and holes are made with the dibber, four or five inches apart, in each of which a bean is dropped. Some persons top their beans when the first open blossoms are beginning to set, as this is supposed to forward the crop a few days. If attacked by the black fly, they are also topped, to stop its ravages.

The seeds of seakale and celery are sown in this month, the former to raise plants to be transplanted the following year. Seakale should be sown in very rich soil ; and if the seed-beds are four feet by ten feet, each will require two ounces. Some, however, sow the seed thinly in patches where the plants are to remain, and a capital plan it is if the ground can be spared. The following year, in March, the plants sown in seed-beds are generally transplanted into a deep sandy loam, thoroughly enriched with manure, including seaweed, if it can be procured ; or, if not, a sprinkling

of salt. The plants are planted in rows two feet apart every way. The young plants, before they are transplanted, should be covered during winter with loose stable litter, dead leaves, and seaweed; and the young plants, after transplanting, should have a similar covering the first winter; but the second winter they should be covered with sand, leaves, or ashes to the depth of six inches, in order to blanch the stems of the young leaves, which in the following spring will be ready to cut. Sometimes earthen pans, called seakale pots, are used instead of the sand, &c. The seed for the principal crop of celery is generally sown in March. The seed is a long time coming up, generally a month or six weeks. The amateur may be interested to learn how the fine celery often shown by the amateurs of Nottingham is grown. Their method is thus described by Mr. W. P. Ayres, the well-known gardening-writer, who has had good opportunities of observing their practice:

“For the cultivation of celery the ground must be thoroughly drained to the depth of three or four feet, trenched, and enriched to the depth of two feet by the addition of manure and leaf soil, the manurial matter being as intimately mixed throughout the soil as possible. The best way is to trench and ridge the soil in early autumn, mixing the dung as the work proceeds. During the winter, in dry and frosty weather, the ridges should be frequently forked over, and in March or April they may be levelled down, and trenches for the plants prepared. These must be four feet apart, and dug out twenty inches deep and twelve inches wide, and should run north and south. The bottom of the trench must be trodden quite firm, and eight inches of perfectly decayed but rich horsedung, trodden firm, placed in it. The soil being then returned, the trench is ready to receive the plants. The reason for placing the dung so low is that the roots may get to it and feed upon it just at the time when the centre leaves, those that will be blanched for exhibition, are pushing up. To produce plants for the early October exhibitions, the seed is sown very early in April or March. A slight bed of hot dung must be made up to receive a small frame or hand-glasses, covered with good soil, and the seed sown thinly. When the plants have two or three leaves they are to be planted in nursery beds prepared by treading a piece of ground tolerably firm, and placing on it about four inches thick of rotten horsedung and leaf mould in equal proportions, which, being trodden firmly, is covered with an inch of rich fine soil. The plants must be put

out in lines four inches apart, each being pressed firmly. Properly cared for, they will be fit to be transplanted to the trenches in two months from the time of sowing, say by the end of May. Then each trench must be forked over a full spit deep, and the plants put out a foot apart, preserving every fibre. Press the soil firmly about the roots, water well, and shade the plants until they are re-established. The summer treatment will consist of thorough cleanliness from weeds; copious watering twice or thrice a week according to the weather; and protection of the plants from being broken by rough winds. It may be even necessary after the plants get a foot high to tie them loosely with matting, but the ligature must not at any time be allowed to get so tight as to cut the plants. In watering it is necessary that the water be warm from exposure to the sun. When the plants are six inches to nine inches high, weak manure-water may be given at each alternate watering, and a handful of soot may be scattered occasionally around the plants.

"It is not customary to earth the plants much until they get the final earthing, but a little soil scattered over the roots about once a fortnight serves as a mulching, and encourages the roots to spread. From five to six weeks is the time necessary to insure thorough blanching, and that is a very essential point in growing celery for exhibition. At the time of earthing, the small leaves, and any suckers or secondary shoots that may have formed, are removed from the base; and then each plant, to the height the soil is to reach, is folded in clean, strong, white paper, and tied loosely with thin matting, not over strong, as it is necessary it should give way as the plant swells. Some use tubes, such as drain pipes, around the plants to support the soil, the tubes being filled up to the necessary height with fine light soil; but if tubes are not used, the soil must be banked up in the usual manner. Water must still be applied to the roots, and liquid manure, weak, but copious in quantity, must be freely administered—the weather of course being some guide as to the quantity required. When prepared for show, the celery plants have the small outer leaves taken off, and being washed quite clean, are shown in pairs neatly tied together."

Planting Permanent Crops.—Beds of horseradish and artichokes are generally formed at this season. Horseradish is propagated by cuttings of the root, either of the crown, with one or two inches attached, or of the root, without any visible buds, about the same

length, and planted with the upper end uppermost, as in seakale. These cuttings may either be dropped into holes made by a dibber, fifteen or eighteen inches in depth, and about the same distance apart every way, the hole being afterwards filled in with light soil or wood ashes; or they may be planted while the ground is being trenched, covering them to the depth of eighteen inches. The soil should be rich, free, moist, and at least two feet deep. Horseradish should be dug up every three or four years, and sets replanted on the same ground, as it is nearly impossible to clear any ground of horseradish when it has once been planted there. The plants should never be allowed to ripen seed, otherwise the roots will become tough and rank. Horseradish may be used in more ways than one, judging from the following remarks by Mr. Shirley Hibberd:—"I made a discovery fifteen years ago in this wise. A quarter of horseradish, in an old neglected garden, was trimmed up, and a few cartloads of unmarketable sticks taken out to be burnt with other rubbish for manure. A lot of selected crowns were prepared for planting, and were put away in the potting shed, and covered with litter. For a long time they were forgotten, and on taking them out they were found to have sprouted freely, each crown having a tuft of blanched leaves like 'barbe de Capucin.' We all began nibbling these delicate tops, and found them mildly pungent and blandly sweet—in fact, a capital salad. It has been our custom every year since to force a few dozen crowns in a dark chamber over the pipes, or in a bed with seakale. Amongst dozens of persons who have eaten this salad, not one has failed to praise it, whether *pur et simple* or employed as an ingredient in the bowl. One of our friends has lately taken to produce it by throwing a lot of crowns into a warm-water tank, and his system is better than ours." Artichokes are propagated by rooted cuttings taken off the old plant, and put into the ground in this month. The suckers should be planted in rows four feet asunder, and two feet distant in the row. The soil ought to be deep, sandy, and rich, and seaweed is said to be an excellent ingredient in the manure for this plant, being the manure used in the Orkney Islands, where the artichoke grows stronger than anywhere else. The principal kinds of artichoke are the Globe, which has a globular purplish head, and is the kind usually grown in England; and the French, which has a green oval head, and which is said to be much hardier than the other kind. Artichokes are generally

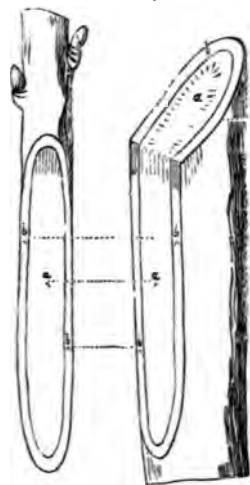
cut the second year, and the plantation will continue productive for six or seven years.

Raspberries should be pruned in this month. As the same stems, or canes as they are called, of most of the kinds, never produce fruit two years in succession, it is customary to cut down the stems that have borne fruit every autumn as soon as the fruit is gathered, but the young shoots should not be pruned till the following March. Each cane should then be shortened to two-thirds or three-fourths of its length, as the extremity of each shoot generally consists of weak wood, which is not at all likely to bear fruit. If large fruit is wanted only a few canes should be left to each stool (root); but when a large crop of fruit is wanted, without regard to the size of the berries, more than half the number of canes should be left, and only those cut away which appear weak or are ill-placed. Care should be taken, whatever canes are removed, to cut them close to the root. Some gardeners recommend fixing a circle of stakes round each plant, about a foot distance from it so that when the canes are tied to the stakes, each of them shall be bent outwards, as this position not only facilitates the development of the buds, and exposes the fruit to the influence of the sun and air, but it allows room for the suckers to rise from the root without shading the fruit-bearing canes. Another mode of training is to let half the number of canes on each plant be bent over, and tied to half the number of the adjoining plant, so as to form a series of arches, and this has a very pretty effect, as well as being very efficacious in producing a larger crop of fruit. Another plan is to train the canes to iron or wooden rings like Dahlias, and another to twist or plait them together. Various other plans have been suggested, and, in fact, almost any mode of training may be adopted, the main objects being to keep the stems of the raspberries erect or slightly bent, so as to promote the development of flower-buds, and to afford air and light to the fruit. Every amateur should grow the autumnal fruiting raspberries—the October Red and the October Yellow—these do not bear fruit on the shoots of the preceding year, and all their canes should be cut down close to the ground in early spring.

Grafting fruit trees is generally performed in March, and it consists in uniting a shoot of one tree, called the scion, to the stem of another, called the stock. Grafting is generally performed on fruit trees, in order to unite a scion of some valuable kind to a hardy

stock, the true fruit of which is probably of no value. New kinds of fruits are also propagated in this manner quicker than they can be in any other way. It is necessary, however, that the plants which are to be united by grafting should bear a certain resemblance to each other: as for example, a peach may be grafted on an almond or any kind of plum; but it cannot be grafted on a pear tree or an apple tree. It is quite immaterial whether the scion and the stock are of the same thickness; all that is necessary is, that the stock should not be thinner than the scion. There are several

FIG. 9.



Scion and Stock, to illustrate the principle on which they are united.

kinds of grafting, but the principle in all is the same; and it consists in binding the newly cut sides of the scion and the stock together, so that they may unite. It must be observed, however, that it is only the parts which are in a growing state that can unite. Thus the parts marked *a a*, in fig. 9, which show the wood already formed, never thoroughly unite; but if an old grafted tree be cut down and examined, it will be found that the portions of the wood which were formed before grafting have only been mechanically pressed together, and may be separated without the aid of a knife, though in the new wood, formed after grafting, no distinction can be perceived between the stock and the scion. The vital union therefore is formed solely by the coalition of the growing parts of the two, marked *b b*, in fig. 9.

It must be observed, however, that this growing part is not in the bark itself, but in a sort of moisture found between the inner bark and the new wood. It is therefore absolutely necessary that some portion of the inner bark of the stock and the scion should be so closely bound together that the glutinous moisture emitted by the two should mix; and for this reason, if the scion is smaller than the stock, which often happens, it must not be put in the middle of the cut on the stock, if by so doing its inner bark rests against the wood of the stock, but on one side, so

that the inner bark of the scion may press on the inner bark of the stock, at least on one side; as it is only in the inner bark that the union takes place. At first the appearance of the grafted tree is very ugly, when the stock is much larger than the scion; and the scion looks so awkwardly placed, as to create a strong desire to put it in the middle; but in process of time the bare part of the stock becomes covered with bark, and as the diameter of the scion increases every year by the deposition of fresh wood, the whole becomes apparently one tree, though the point of union is always more or less perceptible. In some cases, where the scion is of a quicker habit of growth than the stock, the scion becomes so much larger than the stock, as to bulge over it in a very singular and curious manner. As the glutinous moisture or cambium is most abundant when the tree is in a state of vigorous growth, which is in spring, when the buds are bursting and young shoots are about to be formed, it is evident that spring is the best period in the year for

FIG. 10.

*Bow Saw for cutting off branches of trees.*

grafting. The materials used in grafting are a knife, which will also serve for budding; a saw for cutting off the heads of the stocks or large branches to be grafted; some strands of bast matting, worsted thread, or shreds of cotton cloth for tying the scion to the stock; and some grafting clay, or grafting wax, to put over the outside to prevent the cambium from being dried up, as it is only while it is in a moist state that the two kinds of inner bark can unite. Grafting clay is prepared by mixing clay of any kind, or clayey loam, fresh horse or cowdung, free from litter, in the proportion of three parts in bulk of clay to one of dung; and adding a small portion of hay, not, however, cut in too short lengths, its use being analogous to that of hair in plaster. The whole is thoroughly mixed together, and beaten up with water, so as to be of a suitable consistency and ductility for putting on with the hands, and for remaining on in wet weather, and dry weather without cracking. The beating is

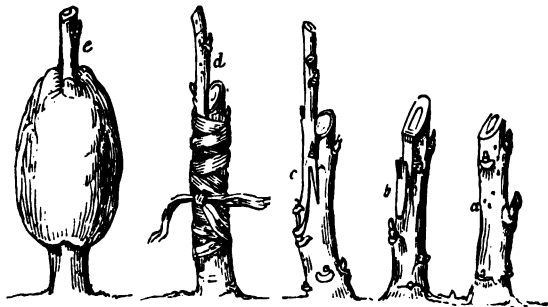
performed with a beetle or rammer, on a smooth hard floor under cover, turning over the mass, and adding water, and then beating afresh, till it becomes sufficiently softened and ductile. The process of beating must be repeated two or three times a day for several days; and it should be completed from three weeks to a month before the clay is wanted; care being taken to preserve it in a moist state by covering it with mats or straw. The grafting clay used by the French gardeners is composed of equal parts of cowdung free from litter, and fresh loam, thoroughly beaten up and incorporated. Grafting wax is generally made of one pound of cowdung, half a pound of pitch, and half a pound of yellow wax, boiled up together, and heated when wanted in a small earthen pot. For another kind of grafting wax equal quantities of turpentine, beeswax, and resin are melted together.

The amateur will be glad to learn that all the trouble and nastiness consequent on the use of grafting clay may be dispensed with. If the old-fashioned preparation were the most perfect system in the world as regards favouring the union of the graft and stock, it necessitates a preparation so mucky and disagreeable that few are likely to resort to it except professional propagators and those who have a great deal of grafting to perform. Our neighbours the French, who are far before us in grafting, have long ago discovered several kinds of mastic or grafting wax which have proved perfectly efficacious, while not so disagreeable to make or so clumsy in application as the mixture of clay, &c., we now use. Some of their mastics are used hot, others cold, and we need hardly add that the one which may be bought ready prepared and used cold is very much the best for the amateur. One of the best, if not the very best, kinds of French grafting wax has been introduced by Messrs. Hooper, of Central Avenue, Covent Garden, and is now being sold by them under the somewhat awkward name of "Mastic l'Homme Lefort." When this is sufficiently known, it will prove a great aid to every person interested in any kind of grafting. It is sold in canisters at a very low price, and its advantages are, first, that it keeps well, and may be used at any time that grafting is being performed; secondly, it may be spread about a graft as easily as butter on bread, by means of a blunt knife—a very different operation to that of plastering grafts with dung, clay, &c.; thirdly, it is more conducive to the success of grafting than the old material, which sometimes used to be retained in position with difficulty, and offered

conditions so favourable to root development that occasionally roots were sent into it, and of course under such circumstances success was impossible. It is perfectly applicable to the grafting of the vine and every other plant. It will tend very much to make the art of grafting really popular and useful to the amateur and practical gardeners of this country; at present it is almost entirely confined to professional propagators.

Whip-grafting, or, as it is sometimes called, splice or tongue-grafting, is the kind most generally in use. "It is performed," Dr. Lindley observes, "by heading down a stock; then paring one side of it bare for the space of an inch or so, and cutting down obliquely at the upper end of the pared part towards the pith. The

FIG. 11.



Whip-grafting in its different Stages.

scion is levelled obliquely to a length corresponding to the pared surface of the stock, and an incision is made into it near the upper end of the wound obliquely upwards, so as to form a tongue, which is forced into the corresponding wound in the stock; care is then taken that the bark of the scion is exactly adjusted to that of the stock, and the two are bound firmly together. The use of tonguing is merely to steady the scion and to prevent its slipping."

Fig. 11 shows the manner in which this operation is performed more in detail. The stock is first cut over at the height at which the scion is to be put on, as shown at *a*, and a thin slice of the bark and wood is then cut off with a very sharp knife, so as to leave a perfectly smooth even surface, as at *b*; the scion, which should at least

have three buds, and need never have more than five (the top one for a leading shoot, the next two for side shoots, in the case of fruit trees, and the lower two to aid in uniting the scion to the stock), is next cut, so as to fit the prepared part as accurately as possible, at least on one side; then a slit or tongue, as it is technically termed, is made in the scion, and a corresponding one in the stock, as at *c*. All being thus prepared, the scion is applied to the stock, inserting the tongue of the one into the slit of the other (*c*); then the scion is tied on with matting, as at *d*, and lastly, it is clayed over, as at *e*, with grafting clay, or better, with grafting mastic, and the operation is then considered complete.

Laying down Turf in Pleasure Grounds.—The ground on which turf is to be laid should be dug over, levelled, trodden down, and raked. It should then be left for a few days to settle, and afterwards rolled with a large stone or iron roller. In some cases two or three inches of light soil are spread over the ground; but this is generally only considered necessary when grass seeds are sown instead of using turf. The best turf for gardens is that taken from fields or downs on which sheep have been pastured, as these animals destroy the coarse grasses by their habit of biting close to the ground. In cutting turf from a piece of grass land it is necessary that a garden line be first stretched, in order that the cutting may be perfectly straight. The turf should be cut with a proper turfing iron, called a turf-racer or verge-cutter, in pieces a yard long, a foot broad, and about an inch and a half thick; and as the pieces are cut they should be raised with a turf-spade, by which the turf is pared off in thin slices. It is then rolled up, with the grass side inwards, as closely as possible, so as to make the rolls sufficiently firm to be carried without breaking. Before laying down the turf, if the ground happens to be dry, it should be slightly watered. When the turf is laid down the edges should be carefully joined, and the pieces made to fit exactly to each other. They should then be well beaten with a heavy wooden beater, and afterwards well rolled.

Lawns that have been established for some time should also be rolled at this season, when the surface is moderately dry; and the worm-casts should be removed either by breaking and scattering them with a long pliable pole, or by passing a wooden roller over the grass, to which the worm-casts will adhere, and from which they can be easily brushed off. When grass is rolled, the edges

often look rough and untidy, and gardeners, to make their lawns look neat, are in the habit of cutting the grass with a turf-racer or verge-cutter, sometimes called an edging-iron, though in doing this they diminish the size of the grass a little every year, and besides, generally leave a piece of bare earth at the edge of the grass, which has a very bad effect. The grass ought in all cases to slope gradually down to the bed or gravel by which it is bordered; and where beds are placed upon grass, the grass should never be cut with the edging-iron, as doing so must inevitably increase the size and injure the shape of the beds. In such cases the grass should be clipped with the shears. Verge-cutters are, however, useful when they are employed only to cut off the spreading shoots or leaves of grass edgings which extend over the gravel, without paring away any portion of the soil.

Mowing Grass on Grass Plots and Lawns.—Where it is wished that the grass on grass plots and lawns should be fine and smooth, it should be rolled frequently, and mowed once a fortnight till it ceases to grow in autumn. Frequent rolling in March and April is of the greatest importance; and if this is carefully attended to and the grass is kept regularly mown, a fine velvety lawn will be the result. A good and handy mowing machine is preferable to the scythe.

Weeds.—It would require a long list to enumerate even the chief sources of pleasures and profits derived from the garden, but one word tells of more than half its annoyances and pests; that word is weeds. In many places where good professional gardeners are kept weeds are sources of trouble enough, and even in good establishments one sees a too luxuriant crop now and then; but in a great number of amateur's gardens, where the garden gets only partial attention, and where labour is scarce, they are a thorough nuisance, and not only disfigure the garden, but harm the crops, and propagate their evils for the benefit of the surrounding country. "I cannot keep down the weeds," is a common remark among amateur gardeners. It is no easy task to eradicate them when once they have become well established. The soil of gardens, originally as a rule selected for its fertility, and perhaps annually enriched during ages, is usually "virgin earth" to the weeds. If allowed their own way in it, they get on quite as well as the thistle on the pampas, and for a precisely similar reason—i.e., the soil is exhausted to some extent of the constituents that are relished by the plants it

has grown for years, and full of nutriment for those of another character. When a garden is utterly neglected, it is surprising to see how soon the walks and every other surface get covered with rank weeds, and how quickly they extirpate many garden plants.

Notwithstanding all this, it is a fact—and a comforting one—that a garden may be kept thoroughly clean at much less expense than is required to maintain it in a filthy state. A very little labour judiciously applied does more towards perfect cleanliness than a great deal brought to bear at the wrong time. Where weeds are allowed to grow large, they require ten times the trouble to exterminate them than when attacked in a tiny seedling state. Some people never take notice of weeds till they begin to rival the plants in size, and perhaps illustrate the arrangements of nature for the dispersion of seeds by floating their feathery parachutes through the air. To allow them to seed is of course gross mismanagement; but to prevent that is not enough. They should never be allowed to get so large that when they are cut off it is necessary to remove them from the spot in which they grew. It is the raking and removing after the hoeing which causes the waste of labour. Once let them get up, and then it is not a mere hoeing that is required, but a “clearing” on a small scale. When cut down, it becomes necessary to remove the untidy swath from the ground, and to rake it; and in doing this in a large garden as much labour is often thrown away as would suffice to keep one twice the size in a creditable state. If ground is systematically and frequently hoed no raking is required, and the young plants perish, and leave no trace after the first hour’s sun they are exposed to. The Dutch hoe should be passed over every garden once a fortnight. An ordinary workman will cover a great deal of ground in one day, providing the weeds are not large enough to impede his hoe. It should be done in fine or dry weather to prevent the rooting of the weeds. Never mind if the ground “looks clean” a fortnight after it has received a thorough hoeing. Start the hoe again the second Monday morning if convenient; and by pursuing that system through the hoeing season the garden will always look clean. A good workman may hoe the garden over and cut off all the weeds in the bud during a single summer’s day; whereas, when the crop is fully, or even half developed, a week may be required to remove it; and throughout the season some part of the place is pretty sure to be “up to

the eyes in weeds." See that the hoeing is well and regularly done.

While many admit all this as regards annual weeds, they apply a different doctrine to bindweed, dandelion, docks, and the like, and take a roundabout way of exterminating them. No weed can live if you persist in destroying its leafy or above-ground portion before it has had time to become well developed. This is indisputable. The obvious inference is that all weeds whatever may be destroyed in this way. By making it a rule to have infested crops visited once a week or fortnight, and the weeds carefully cut off, you will get rid of every particle of noxious vegetation. Who has not seen the endless huntings and diggings after the roots of convolvulus? No amount of winter digging can exterminate this pest, but a very trifling but regular attention in summer will do so. There was once an "experienced and practical horticulturist" who made a brave but expensive attempt to get rid of it. A plot of strawberries was infested by it, and very unproductive in consequence of its tortuous wrappings. Being a man of resolution, he determined to cart out the whole plot on to the farm, and he did it to the depth of two and a half feet! That cost a good deal of labour, but horses and men were plentiful, and soon carted in a lot of loam to fill up the vacancy. *Convolvulus sepium* was exterminated from the plot, but its removal required as much labour as would suffice to clean a dozen acres. What was the best and cheapest remedy? Why, simply to "dig in," or throw out the strawberries, and plant a crop of, say Brussels sprouts, or any thinly planted crop, among which a boy could easily pass once in ten days during the growing season, and cut off at the ground the rising bindweed, which would probably attempt to twine itself round the stems, and thereby be the more readily cut off at the bottom. By persisting in that as long as the leaf showed itself, it is not difficult to divine what would become of the roots, pertinacious as they are when allowed breathing space.

Weeds on walks are often the most troublesome. Wherever a loose shingly gravel is used, or one that does not "bind," hoeing and raking are permissible; but it is very undesirable in the case of walks like those about London, which bind thoroughly, and when well made and dusted over with a little shell are the best walks known. If the traffic is not sufficient to keep them free from weeds they must be either salted or hand picked. Salting is the

best plan, but it cannot well be applied where there are box or other living edgings, as of course the first heavy rains will place the roots in a medium about as congenial to their wants as if they were planted off Sheerness in the salt sea. If walks are well gravelled, picking them is not a very troublesome operation; but after a season or two the gravel gets infested with a myriad of small weeds. Human patience has not been made sufficiently elastic to enable us to pick out these, and therefore such must be turned over in spring and a coating of new gravel applied. Salt may be applied to walks cut in the turf. Active boys are the best for weeding of all kinds; their labour is usually very cheap, a good one is quite as useful in this way as a workman who may cost three or four times as much. In hoeing the garden, seed-beds and other such closely-planted surfaces must of course be passed by, but they should be hand picked nearly as frequently as the general surface is tickled with the hoe. Where box edgings are employed, they should be regularly hand picked.

So full of seeds of various kinds is the ground in spring, that when we sow a crop of any good seed—flower or vegetable—it is sometimes difficult to distinguish the crop from the weed, and both are allowed to grow up together. To obviate this, seeds should not as a rule be sown broadcast, but in drills, or little lines or circles, according to kind and taste, and then when they come up it is easy to separate the sheep from the goats.

In removing plantain and other weeds from lawns, croquet grounds, &c., it is desirable to do so as early in the summer as may be convenient, to prevent the plants depositing their seeds, and thereby preparing a vigorous crop for the following year. Use a knife somewhat like an oyster-knife, cut the crown clean off as deep as the knife will conveniently do its work, and disturb the turf as little as possible. Steal the weeds out in fact. Boys, it may be observed, are of a gregarious, playful, and chattering disposition, and when more than one or two are employed, it is not a bad plan to put a full-grown male in charge of the operations.

Dividing and replanting Perennial or Herbaceous Plants in the Flower Garden.—These plants either increase a little every year, or become untidy in their growth by pushing themselves out of the ground; and, in either case, they want taking up, trimming, and replanting. In some cases the root, when it is taken up, is divided; and this gardeners sometimes do with a spade, which will answer

with hardy coarse-growing kinds, but the division of choice and delicate plants should be carefully done by separating the roots with the hands, and, when any of the roots are broken or bruised, the injured part should be cut carefully out with a sharp knife. If the plant is large, the spade should be thrust into the earth three or four times, so as to make a complete square round the plant, which will then only require detaching at the bottom to be raised by the spade out of the earth. When the plant has been divided, and all the decayed part, if any, cut out, a hole should be prepared for its reception, which should be first dug larger than is required, and then partially filled in with light earth, so as to be only a little larger than the plant which is to be put into it. When the plant is put in, the remainder of the hole is filled up, and the earth pressed firmly round the collar of the plant, which should then be watered, and which will soon afterwards begin to grow, as the roots will have no difficulty in penetrating the light earth provided for them by the partial filling up of the hole.

Box edgings for beds and borders are generally planted at this season. First, the ground should be rendered firm and even by digging, treading, and beating with the back of the spade; secondly, a narrow trench should be accurately cut out with the spade, in the direction in which the edging is to be planted; and thirdly, the box having been previously pulled into small pieces, and a portion of the top having been cut off and also the lower part of the root, the plants should be thinly and equally laid in along the trench, their tops being all left about an inch above the surface of the soil. The mode in which a gardener performs this operation is as follows. He places himself with his left side next the trench, and then kneeling on his right knee close to it, he takes a small piece of box in his right hand and places it in the trench, keeping it up with the back of his left hand. He then proceeds in this manner till he has as much box in the trench as he can keep up at one time with the back of his left hand. He then, with his right hand, draws enough soil to the roots to keep the plants he is holding up in their proper places, and then recommences planting again till the row is finished, when the trench is filled in with soil with the spade, and firmly trodden in against the plants, so as to keep the edging exactly in the position required. The trench should always be made on the side next the walk; and after the soil is pressed down, and the walk gravelled, the gravel is brought up over the

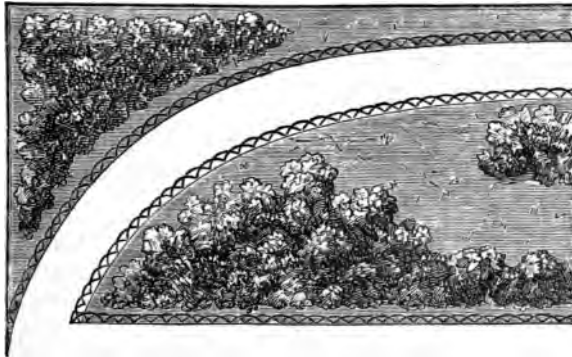
soil, close to the stems of the box, so as to cover the soil at least an inch in thickness, and to prevent any soil being seen on the gravel-walk side of the box. This also prevents the box from growing too luxuriantly, as it would be apt to do if the trench were on the border side, when the plants would lean against the gravel; and the roots, being entirely covered with soil, would grow with so much luxuriance that the plants would be with difficulty kept within bounds by clipping. A box edging once properly made, and clipped every year, so as to form a miniature hedge, about three inches wide at bottom, three inches high, and two inches wide at top, will last ten or twelve years before it requires to be taken up and replanted; but if the edging be allowed to attain a larger size—say six inches wide at bottom, six inches high, and three inches wide at top—it will last fifteen or twenty years, or probably a much longer period. It is necessary to clip box edgings every year; as, unless this is attended to, the plants will not only grow out of shape at the top, but their stems will become bare below.

Permanent edgings.—Amateurs are so often disappointed with box and other living edgings that they frequently use tiles for edgings. "Any variety of brick, imitation stone, or terra-cotta edging, is the ugliest and most unsatisfactory thing that can be admitted into an ornamental garden. Massive edgings of stone around panels, &c., in geometrical gardens, are of course not included in those alluded to. Pottery edgings are enough to spoil the prettiest garden ever made, and are as much at home round a country seat as a red Indian at a mild evening party. Looking at them as they are carefully arranged by exhibitors in one or two of our public gardens, you may possibly think they are clean, symmetrical, and everything to be desired. But when brought home and arranged round the borders their true charms begin to display themselves. Being all of an exact pattern they must be arranged so as to look quite straight in the line. If they wobble about, one this way and one that, the line is not agreeable, even granting that the things themselves are tolerable. It is difficult to 'set' them easily and cheaply, so that they will remain erect. To have them set by a mason is a plan resorted to by some; but it is simply a way of wasting money. Of course, a good workman may arrange them neatly enough by ramming down the soil firmly on each side; but even then, they are, after all, the worst variety of edging known.

They are also often of a texture that cracks into small pieces with the first frost, though there are some much more tenacious. The expense in the first instance is heavy, and one way or another they become unsatisfactory, till there is no tolerating them any longer, and they are thrown by with the old iron or the oyster-shells.

"The reason why people have resorted to them is, that the edgings ordinarily used often prove disappointing and dirty, and they long for something that will be neat and tidy at all times. To abuse a bad thing without offering a better, or any at all, is often no better than to stand still and tolerate a nuisance ; but in this instance I am able to recommend a capital permanent edging—

FIG. 12.



Cast-iron edgings.

everlasting, in fact, and with nothing that could offend the most critical taste. It is simply made of rustic rods of cast iron, in imitation of the little edgings of bent branchlets that everybody must have seen. They are evidently cast from the model of a bent branchlet, generally about as thick as the thumb, but they are of various sizes. The marks where the twigs are supposed to have been cut off are visible, and altogether the thing looks as rustic as could be desired, is firm as a rock when placed in position, and, in a word, perfect. These irons are of course placed in the ground firmly, and as shown in the figure. They may be set up by anybody. The fact that they are not stiff and ugly tile-like bodies

prevents their offending the eye if one or two should fall a little out of place here and there. But this is nearly impossible; for at the place where every two sticks cross each other they are tied by a little piece of common wire.

"They should be so plunged in the walk, or by the side of the walk, that about seven inches of the little fence appears above ground. This, however, may be varied with the size of the subjects which they are used to encompass; six or seven inches is the height given for edges for ordinary purposes. They are equally useful for the park, pleasure-ground, or even the kitchen-garden. In parks and pleasure-grounds, however, we usually have edgings of grass, and therefore it may occur to the reader that they are useless therein; but the little fences of bent sticks which furnished the idea for these iron edgings were generally used to prevent grass near much-frequented spots from being trodden upon; and of course those now recommended will answer the purpose better. But it is in much-frequented places along drives and in public gardens and parks, that their chief merit will be found. They may be seen in every public garden in Paris, from the little squares near the Louvre, where you may notice them obscurely running along outside of the ivy edgings, to the slopes of the Buttes Chaumont and the more frequented parts of the Bois de Boulogne, and they must ere long be as widely adopted in England, for it is impossible to find a better or more presentable edging. In all squares or lawns where croquet is played they will be found peculiarly useful in preventing the balls from running over the beds and breaking the plants. In some London squares I have recently noticed the beds raised bodily to a height of fifteen inches above the level, and the turf also raised so as to form a bank around them. All this trouble might be saved in a few minutes by placing these rustic iron edgings around the beds."—*The Parks, Promenades, and Gardens of Paris.*

Gravel walks may be made at this season, or new gravel laid down on old walks that want repair. When new walks are to be made, they should be so contrived as to incline sufficiently to throw off the surface water which arises from rain and melting snow; or if this is not practicable, they should be furnished with drains or a gutter on each side the walk, the gravel being raised a little in the centre. In the operation of forming walks, the first step after the line has been marked out, is to take the levels of the surface, so as to determine the degree of inclination necessary for carrying off the

water, and also what quantity of soil will have to be removed on each side of the walk, so as to reduce the whole to a uniform surface. The next step is to mark out the width of the walk ; after which the soil is to be excavated. The depth of the excavation will depend on the nature of the subsoil. If that be dry and absorbent, such as gravel or rock, then the depth need not be more than a foot or eighteen inches ; but if the subsoil be retentive, such as clay or loam, then the depth, at least in the centre of the walk, should be between eighteen inches and two feet, and it should be at least one foot in depth at the sides. The drain may be made in the centre, that being the deepest part ; and this being done the excavation is to be filled up to within nine inches of the surface with small stones, broken brickbats, and similar materials, which are to be well beaten down with a rammer. On this surface a layer of coarse gravel, three inches in thickness, should be laid and well rammed down : then the remaining six inches should be filled in with the best gravel, which should not be rammed, but rolled, after having been raked to an even surface. If the walk is to be edged with box, that should be planted immediately before laying on the three-inch stratum of coarse gravel ; but if it is to be edged with turf, the most convenient time for laying it down is before putting on the upper stratum of six inches. When once made gravel walks will remain good for a long time, if kept clean by the removal of all extraneous matters from their surface, including weeds and worm-casts. Leaves and other loose matters are, of course, removed by sweeping ; but weeds should be hand-picked or hoed up. Some persons recommend destroying the weeds with strong salt and water ; which will also kill the worms ; but this is a dangerous practice wherever there is an edging either of grass or box, as though great care may be taken not to let the salt and water touch either the box edgings or grass near the walks when it is laid on, yet the rain will wash some of the saline particles to the sides, and they will turn brown and kill any vegetable they touch. If the walks appear uneven or of a bad colour they should be raked over and rolled ; and if the gravel be loose, it may be made firm by mixing it with equal parts of sand and ferruginous clay, or, if these cannot be procured, with common clay burnt and powdered. Gravel walks should be frequently rolled, and particularly as soon as the outer surface becomes dry after rain ; but never when the outer surface is wet, as portions of the gravel are apt to adhere to the roller.

Transplanting Evergreen Trees and Shrubs.—The transplantation of trees and shrubs generally, and particularly of evergreens and conifers, is a very important subject for amateur gardeners. From the popularity of conifers and the finer kinds of evergreen shrubs, numbers buy them in what is called the specimen stage, *i.e.*, plants larger than the ordinary nursery stock. These furnish "immediate effect," often at a very considerable expense, it is true. In all such cases, and indeed in every case, one of the most important operations in connexion with the tree during the course of its life is its transplantation, and the selection of position—a most important point, for if fine specimens are planted too closely, or in positions not suited to their final development, all is lost just about the time when the trees begin to show their true character and dignity. Instances of mismanagement in this way may be seen everywhere. Assuming that the position is chosen properly, and bearing in mind the final development of the tree, three things should be seriously considered by all about to make important plantations of evergreens—the choice of stock, the time of planting, and the mode of fixing.

By choice of stock we do not mean selection of kinds; that too is a very important matter which ought to be considered long before the arranging and planting has to be performed; but the selection of plants in a good condition for removal. The common experience of the most intelligent practical men has long ago determined that plants which have been frequently removed in the nursery are those which transplant with greatest safety; but the planting and purchasing public are not sufficiently aware of this, and from a want of this knowledge plantations and purses often suffer. Let us take a particular illustration, and one that should be of some interest to all who transplant subjects above the ordinary size for the sake of getting a garden furnished quickly.

Many know that the *Wellingtonia* is a difficult subject to transplant. It is also one of the very subjects which many wish to have in a somewhat advanced state, so that they may see it in vigour without having to wait many years. Now the probabilities are that the majority of inexperienced persons would choose specimens of this plant the least likely to succeed, or rather the most likely to perish, even if they had patience to go through half a dozen nurseries before making a final selection. When the *Wellingtonia* has been replanted, it makes a very short and rather starved-looking growth during the succeeding season, but the roots are in a compact

body, and may all be carried away with the tree ; and the constitution is in that hard and hungry condition which is certain to make the tree a healthy and beautiful specimen when finally planted in good ground. Now in planting small plants, one may not mind their being a little thin and poor-looking, but in selecting specimens to embellish important spots on a lawn people very naturally like a well-furnished plant ; and there is such a very marked difference between those that have and those that have not been transplanted, that they are very likely to prefer the deep green and healthy-looking stock. If to the other differences are added those of rich, good soil, the advantages seem all in favour of the vigorous subject. But in this case, if in any, it is the somewhat distant result that determines the wisdom of the choice ; and the probabilities are that, while the handsome, untransplanted, or insufficiently transplanted tree will be hopelessly checked, or perhaps fail altogether, the less presentable one, that had been moved, grew perhaps on a poorer soil, and scarcely looked so healthy as a British evergreen tree should look, will send its long held back roots quickly through the fresh soil, and, other conditions being favourable, will soon become a healthy, firmly established tree.

Thus it will be seen the future and not the present effect of the specimen to be transplanted should be taken into consideration ; and it should be borne in mind that plants that have been transplanted rarely look so healthy, and never so vigorous, as those which have not been transplanted ; that it is better, as a rule, to obtain young plants from a poor rather than a rich soil ; and finally, that the state of roots of trees to be moved is of tenfold greater importance than the appearance of the tops.

The next consideration is the time of planting. In the case of deciduous trees, the best time for planting is very definitely laid down. The late Mr. Veitch of Exeter used to say, " If you plant before Christmas, you may tell the trees to grow ; if after Christmas, you must ask them to grow ! " This is well worth bearing in mind as regards deciduous trees. But in the case of evergreens it is very different ; we may remove them with safety during the greater part of the year. There is in no garden we have ever seen a handsomer lot of beautiful specimens of conifers than in Mr. Pince's nursery at Exeter ; and he once informed us that he had successfully planted a garden with his finest specimens, working chiefly at night. However, there is no necessity for heavy planting of any kind in hot weather.

What the most inexperienced should remember is that when the planting season for fruit and deciduous trees, and what is usually known as the "planting season," is quite over, he may begin to remove with safety all kinds of evergreens. These may be successfully planted in the months of September and October; but the experience of our most extensive planters of ornamental conifers and evergreens has proved the spring to be the best season. Beginning about the last week in March, or first in April, it may be continued on till nearly the first of June, unless May should prove so hot as to make the labour of transplanting too excessive, which might in some places be a consideration. It ought to be discontinued while the plants are making their vigorous summer growth, but may be resumed towards the end of July; but there is rarely occasion to plant at this season, particularly as so much may be done in early autumn and spring. It should always be borne in mind that evaporation is much more rapid and dangerous to the young roots in the best season for the planting of evergreens than it is in mid-winter, and that much greater precautions ought to be taken to prevent the fine rootlets from being exposed to its influence, except for a very short time.

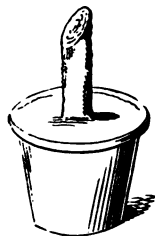
Finally, we come to fixing of the tree in the ground—a much more important point than is generally supposed. In the case of small saplings it is not of so much importance, because the wind can have little influence upon them. But if specimens of any size be planted ever so firmly, the wind soon sways them about, and the tree is from that moment in danger. Rooted naturally in the ground, every fibril of a plant is a support to it; it has, in fact, a grip of almost every particle of soil in the large and heavy mass inhabited by its roots. The storm may bend its stem like a slender twig, but with a sound root it suffers no injury. In all trees properly prepared for transplanting, the roots are within a narrow compass, as they must be in the case of large specimen trees that have been transplanted. Having at first no connexion with the ground in which they are freshly placed, they wobble about with the slightest breeze, and of course every fibre that is attached to the specimen is injured by these movements; they can, in fact, but with difficulty take root while influenced by them. The branches and leaves are fitted to live in the changeful air, and they may be allowed to sway about, but the trees must be firmly fixed at the lower part of the stem. In the case of large specimens this is best

effected by three wire ropes, attached to a ring of matting or like material firmly bound with wire, and fixed to strong pegs in the ground; and in the case of smaller ones, by driving three stout pegs in the ground, so as to let them nearly meet at the stem, and tie straw ropes so firmly around and between them and the tree that perfect firmness is afforded to the base. They should of course be driven in the ground in a sloping direction, and away from the centre of the ball, and should be so fixed that, while affording immovable supports wherewith to fix the tree, they could not, even in case of the ropes or intervening material wearing out, ever injure the bark.—*Field.*

Plant Houses—Management of Greenhouse Plants.—The weather will now probably be sufficiently mild during the day to do without any fire-heat; but it will generally be necessary to have a little fire at night; as, though the evening may not be very cold, it may become frosty before the morning. At this season there are frequently sudden changes in the weather, and a mild evening is followed by a sharp frost in the morning. As the plants will now begin to grow, they should be watered regularly, and occasionally syringed over-head. In this month the greenhouse plants should be all carefully examined; and those that appear to be in pots that are too small should be shifted into larger pots. The new pots should be quite clean and dry; and it is generally considered advisable that they should be only one size larger than those in which the plants have previously grown. The first thing to be done is, to put some pieces of broken pot over the hole at the bottom of the fresh pot, to insure drainage; and it is generally considered better to use several small pieces of potsherds, as these pieces of broken pot are called, than two or three large ones. When the drainage is properly arranged, and a little rough turfy mould, or moss, put over it, the plant to be changed is taken out of the first pot by turning it upside down, holding the left hand on the surface of the soil in the pot, and with the neck of the plant between the two middle fingers, while the bottom of the pot is held with the right hand; and then the ball is loosened by the edge of the pot being struck against any fixed object, such as the side of a potting-bench, or the handle of a spade stuck in the ground. The ball containing the plant will thus drop out into the left hand, and the potsherds that are loose at the bottom of the ball having been taken off with the right hand, the ball is set in the middle of the pre-

pared pot, and the interstices between the ball and the sides of the new pot are filled in with earth and made firm by lifting up the pot with both hands and setting it down two or three times with a jar, so as partially to consolidate the whole; and afterwards made more firm by pressing the earth at the sides of the pot with a small stick. The pot is then to be supplied with water to such an extent as to moisten the whole of the earth which it contains; and it may be set where it is finally to remain without the necessity of shading.

FIG. 13.



A Stock cut over for inarching when it is twice the size of the Scion.

Inarching, which is something between grafting and layering, is generally applied to camellias and other woody greenhouse plants, but sometimes also to hardy trees, such as the purple beech and some varieties of evergreen oak. In it the scion is only partially separated from the parent plant, in such a manner that while it is uniting with the stock, it derives a portion of its nourishment from the plant to be propagated. For this purpose the stock, if intended to grow in the open

FIG. 14.



A Scion prepared for inarching when it is only half the size of the stock.

FIG. 15.



A Scion and Stock prepared for side inarching.

ground, is planted near that from which the scion is to be taken; or if in a pot it is placed near it, in such a manner that a branch from the scion can be readily joined to the stock. There are various modes of inarching: sometimes the upper part of the stock is cut off entirely, as shown in fig. 13, and a slice having been cut off the side, or a slit for a tongue made, the scion is split so as to fit it, as shown at *p* in fig. 14; and at others a thin slice is cut off both the stock and the scion, as shown in fig. 15, and being made to fit each other, as shown at *a* in fig. 16, they are tied together with bast matting, as shown at *b*. This is called side-inarching, and it is sometimes performed with a tongue. The stock is sometimes cut off immediately above its point of junction with the branch joined to it; but more frequently the stock is left at length. In all cases the scion is made fast to the stock by tying them together with strands of matting, and the graft so formed is covered with moss tied on, or with grafting-clay or grafting-wax. After a certain period, the scion and stock unite, when the former is separated from the parent, and the stock is cut over a little above the graft. After some further time, when the scion begins to grow vigorously, the stock is cut close over above the point of union, and the section left becomes in time covered with bark.

FIG. 16.



The Scion inarched to the Stock and bandaged with matting.

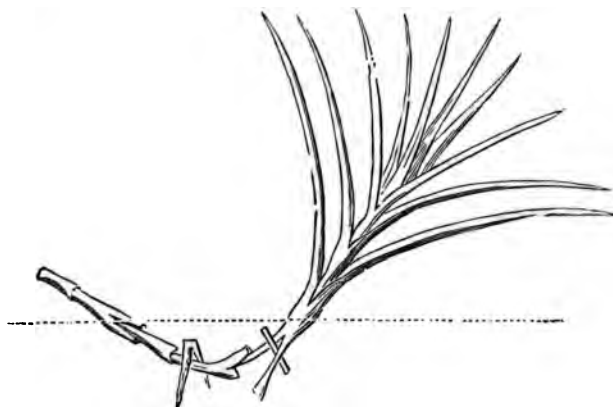
Layering is performed by bending down a young shoot of a plant to the ground; and, after fixing it there with a hooked stick, covering it with earth. This is done in order that roots may proceed from the joint of the plant that is buried; and to facilitate the formation of these roots, a notch or slit is generally made in that part of the shoot which is buried in the soil; or it is twisted, and a portion of the bark taken off; or it is in some other way wounded, bruised, or injured, so as to check the return of the sap by the bark, when the sap, accumulating at the upper lip of the wound, forms a callosity there of granulated matter, from which roots are soon after emitted. Fig. 17 shows the mode of layering any suffruticose

FIG. 17.

*A Suffruticose plant layered.*

plant, a small piece of stick having been put into the notch or slit to keep it open, though this is not always necessary. It will be ob-

FIG. 18.

*A Carnation layered.*

served that the notch or slit in layering the carnation (see fig. 18) and other suffruticose plants, is made on the under side of the shoot, but in the case of woody plants it is made on the upper side. In both cases the knife is entered immediately below a bud or joint; roots being always more freely protruded at the joints of plants than in the intervals between them. The leaves are always stripped off that part of the layer which is buried in the soil. Roses and various other woody plants may be easily propagated by layers; as may cananations, pinks, chrysanthemums, and many other kinds of plants both tender and hardy.

Cuttings.—Many greenhouse shrubs are propagated at this season by cuttings, that is, by portions of the branches cut off at a bud, which are best taken off just where the young shoot unites with the old wood, so that a small portion of the old wood may remain attached to the cutting. To understand why cuttings must always be divided at a bud, we must observe that the branches of shrubs consist of a number of joints or nodes, and of spaces between them called internodes; and that the vital forces of the plant are concentrated at the joints, where alone buds can be produced. Each bud is in fact a plant in itself, and is capable of producing an upright shoot or stem, as well as leaves, and of sending down roots. When the entire branch remains on the tree, only the ascending shoot of each bud is developed, and as it grows it becomes a new branch; but when a part of the branch is cut off, the joint cut through becomes granulated, and develops roots. As, however, all the vessels of a cutting are divided, there is danger of water ascending through them and rotting the plant: it is necessary therefore that the end of the cutting shall be quite level, that it may rest firmly either on the earth or on the bottom of the pot; and hence it is found that cuttings of orange and lemon trees, which gardeners always find difficult to strike, will grow if the end of the cutting is cut quite flat, and rests upon the bottom of a pot. "The object of this," says Dr. Lindley, "seems to be to place the absorbent or root end of the cutting in a situation where, while it is completely drained of water, it may nevertheless be in the vicinity of a never-failing supply of aqueous vapour." If, on the contrary, any open space is allowed, or if the bottom of the cutting be left ragged or uneven, water would lodge round it, and rise through the vessels, the ends of which are open in consequence of being cut through. Bell-glasses are often put over cuttings in order to preserve a uniform

humidity in the atmosphere which surrounds them. The shoot should be cut off with what gardeners call a clean cut (as, if it be bruised or left jagged or uneven, it most probably will not grow); and it should be planted in sandy soil, to insure drainage, as the cutting will rot, or as gardeners term it, damp off, if water in a stagnant state be suffered to remain round it. The length of the cutting depends upon the plant; but most cuttings are about five or six inches long; and one or two of the lower leaves must be cut off

FIG. 19.



A cutting of the young wood of a Camellia prepared and planted; the dotted line in this and the following figures of cuttings representing the surface of the soil in the pot.

with a sharp knife close to the stem, as shown in fig. 19. This is done because the leaves, if buried in the ground, would rot and would injure the stem if they were suffered to remain attached to it. Cuttings should be made of camellias and other hard-wooded greenhouse plants at this season, as they, particularly if they have broad leaves, are more difficult to root than soft-wooded greenhouse plants, the cuttings of which are generally made in autumn. The cuttings struck in spring are made from the points of the shoots after the spring growth has been completed, but before the young wood is thoroughly ripened, and if put in in March they will be ready to transplant in August.

Cuttings need not be planted more than an inch deep, and they

FIG. 20.



A cutting of a Cape Heath prepared and planted.

FIG. 21.



A cutting of an Epacris prepared and planted.

should in general be covered with a bell-glass. The cuttings of the different kinds of Erica or Cape Heath (see fig. 20), Epacris (see fig. 21), Diosma, and some of the more delicate kinds of Acacia (see fig. 22), are difficult to root. They should be taken from the points of the side shoots in this month, when the plants have nearly ceased growing; they should not be more than from an inch to two inches in length, and should be cut clean across at a joint, the leaves being clipped or cut off for about half an inch upwards from the lower end of the cutting. Thus prepared, they should be planted in pure white sand, with a little peat soil as a substratum, and the whole well drained. The pot should then be covered with a bell-glass, and placed in a frame or in the front of a greenhouse, and shaded during sunshine. With regard to Ericas, Camellias, &c., it may be observed that nice healthy young plants are so readily obtained in our nurseries, that it is scarcely worth the amateur's while to strike them, though some may wish to propagate their own plants. When charcoal is used for this purpose, it should be previously exposed for some months to the influence of the open air. Cuttings of the different kinds of Cactus and Mesembryanthemum, and other fleshy-leaved plants, may be made at this season, but they will require to dry a few days before they are planted, as if they are put into the ground while the wound is fresh, they will rot. As soon as the wounds however are dry, the cuttings may be inserted in pots containing a mixture of peat, sand, and brick rubbish, well drained, after which the pots should be placed in the flower-house, or on the front shelf of a warm greenhouse, and they may be occasionally watered; they do not require shading.

The Conservatory.—A fire should be lighted every evening, though there may be no appearance of frost, as a conservatory is usually much colder than a greenhouse; and besides, it generally contains plants which have been brought forward in the flower-house, and which have become very susceptible of cold from the heat to which they have been exposed. The plants should be looked over every second day, and watered if necessary, taking care, however, that no wet falls upon the blossoms, as it will induce a premature decay.

FIG. 22.



A cutting of the young wood of Acacia alata prepared and planted.

No other care will be necessary, excepting to remove the plants which have done flowering to some place where they will be preserved from the cold (such as a pit in the reserve-ground), and to supply their place with others brought in from the flower-house.

The Vinery.—Where vines are slightly forced they will probably be in leaf at this season, and will begin to show the incipient bunches: they should not be rigidly stopped at two joints beyond the bunch as is generally done, but at three or four joints beyond it, or even at five or six, provided the vines are not planted too close and there be room for the shoots. The heat should now be increased to 70° in the day and 60° at night; and air must be given freely whenever it can be done without lowering the temperature too much. Whenever the wind is in the east, or north-east, very little air should be given, as it is generally very keen and sharp from those points in the month of March, and sun heat should be conserved as often as possible by shutting up the vinery early in the afternoon, and afterwards syringing the floors, &c., therein.

Sowing Seeds of Tender and Hardy Plants.—Before proceeding to sow seeds of any kind, it is an excellent plan to classify them; it saves time, and it is a step towards success in other ways. They should in the first instance be classed as to hardiness, beginning with the seeds of stove plants.

The taste for subtropical plants, palms, &c., that is now arising is likely to cause many to take an interest in the raising of plants requiring a warm temperature. Their name is legion, and their seeds differ in size, from palm seeds as big as eggs to minute ones requiring scarcely any covering. An amusing catalogue might be formed of the mistakes made in the sowing of seeds, and particularly the seeds of pot plants. All stove seeds should be sown in spring, at any time from January to the end of April, but if obtained in early summer it will be better to sow them at once than lose another season. They should rarely be sown in autumn except where there are very good appliances, as otherwise they are apt to die off in winter. One of the most important points in the raising of seeds of stove plants is keeping them near the glass from the moment they have appeared above the earth, and they should be potted off when very young. A few days' neglect of these points may spoil them. There is not, nor is there ever likely to be, a better position for the raising of seedlings of stove plants than the old-fashioned hotbed or pit heated by stable manure or leaves. The stove with a tan bed is

also excellent ; and they may also be raised in the ordinary stove. In it, however, we have always found ants great enemies to seeds, eating every grain of some kinds in a single night.

Greenhouse seeds are at present required by a larger class than the preceding, and are as a rule better started in the places recommended for the stove seeds than in the greenhouse ; and failing a stove a good hotbed suits them to perfection. If they must be sown in the greenhouse proper, it would be wise to plunge the pots in moss or cocoa fibre, so as to counteract the dry air common to greenhouses. There are palms for the greenhouse as well as the stove. I have seen a list of twenty-eight kinds of greenhouse palm seeds in a seedsman's catalogue, but every one of these I should place in a brisk hotbed and give them a vigorous start. A gentle hotbed will prove an agreeable starting place for seedlings of pelargoniums and plants of that type. Cinerarias should be sown towards the end of summer in a cool frame or pit, and with them the handsome herbaceous calceolarias.

With stove and greenhouse, as well as with many less important seeds, it is necessary to have a good deal of patience. Nothing is commoner than for people to throw away pots of seeds under the impression that they are dead, because they have not come up as soon, or nearly as soon as soft and vigorous kinds, while all the time the seeds are as sound as can be. Some subjects naturally take a long time to germinate ; and some that naturally start immediately after they fall from their pods in autumn, seem to become hardened by being kept over the winter, as our convenience requires. Therefore we should always satisfy ourselves that seeds are dead before throwing them away.

Half-hardy annuals form an important class, particularly as with these may be associated such of the bedding plants as are usually raised from seed. A gentle hotbed is the best place for the generality of these, and if the bed be covered with fine soil and the seeds sown directly upon it, so much the better. The greater number of half-hardy annuals will succeed perfectly if sown in pots, and kept in a cold frame or pit and the lights kept close and shaded till the seeds germinate. No matter how they are raised, they should be gradually exposed to the open air, so as to be quite inured to it before the end of May, or, in the case of the quickest-growing and hardiest things, long before that time. In the case of those sown directly on the soil of a gentle hotbed, the lights may be removed. Some

of this class may be sown in the open air when the earth becomes sufficiently warm, say about the beginning of May, but many people lose them by sowing earlier.

Hardy annuals are like grass ; they may be sown in the open ground at any time without fear of failure. It is, however, needless to sow them at any other time than in autumn or spring—chiefly in September and March—and early or late in spring or autumn as the bloom may be required. Hardy annuals are in many instances improved by being sown in autumn. For example, there is as much difference between a bed of the bluebottle or cornflower (*Centaurea cyanus*) sown in autumn and one sown in spring, as if they were two different plants, the advantage being all in favour of the autumn sown subjects.

Hardy perennials, a most important class, are, as a rule, better treated like the half-hardy annuals, though not a few of them are strong and hardy enough to be sown in the open border like the hardy annuals. When the large-seeded and robust kinds are sown in the open ground, they should be sown in lines, and in a bed or beds specially set apart for the purpose, and where they could be thinned out and used as required. All the finer and rarer sorts, slow-growing alpine plants, &c., should be sown in pots or pans, and carefully looked after till strong. The month of March is, generally speaking, the best time for sowing these. The gentians, many North American plants, some anemones, pæonies, cyclamens, and various other perennials, are slow to germinate, and should be waited for, keeping the pots clear of weeds and in a cold frame during summer.

Biennials, among which are some of the prettiest plants used for spring gardening, require to be sown in June and July, but particular requirements or soils may make it desirable to modify this. They should be sown in some spare nooks in the kitchen garden, and in autumn transplanted to the places in which they are to bloom the following spring or summer. It is a class worthy of much more attention than it usually receives, and includes not a few fine old garden flowers, like the Sweet William.

A few general rules are applicable to all seeds sown in pots :—

1. All pots and pans used for seed-sowing should be well drained in the ordinary way ; and, as fine soil is much employed in seed-sowing, a layer of dry moss or roughish soil should separate the drainage and the fine soil above.
2. The soil on the top

surface of pans, pots, &c., used for seed-sowing should be finely pulverised by sifting, not only to allow the seeds a medium in which to root readily and freely, but also one in which they may be divided with little injury to the roots. 3. Good sandy loam may be taken as the base of most soils used for seed-sowing, but it should always have at least half its bulk of finely pulverised leaf mould, peat, or some vegetable soil in it, and fully one-fourth of the whole should be of sand. Where vegetable soil is abundant it may be employed almost exclusively, always, however, with the addition of fine sand. 4. The soil should be made firm and perfectly level in the pots, particularly in the case of small seeds. 5. All small seeds should be sown very much thinner than is customary. Very often they are sown so thickly that the poor little plants can do nothing but illustrate the "struggle for life," and, when drawn up and etiolated from this cause, the whole batch often perish from mould. Sow thin enough to permit of every plant having room to unfold its leaves when it peeps above the ground. In nine cases out of ten 1000 seeds are sown where 100 would have sufficed. 6. It is a safe plan to cover all seeds with a covering of soil about equal to their own size; but in the case of large seeds, like those of the castor oil plant for example, little nicety as to covering need be observed, as they will push up through a greater depth of soil than we can give them in pots or pans. It is with the smaller seeds that the nicety is required. In their case a perfectly level firm surface is above all things necessary, and very finely sifted sandy soil; for very small seeds it may be nearly all sand. In the case of the most minute class of seeds, of which the *calceolaria* is an example, it is better not to cover at all, but, having made the soil perfectly firm and level with the bottom of a smooth pot, or circular piece of wood with handle attached, water it with a fine rose; and as soon as the water has disappeared, sow the seeds on the surface. Many very small seeds do not start from being too deeply covered, and even some not very small ones often fail to vegetate from the same cause—the Chinese *Primula* for example. 7. All seeds sown in pits, frames, or houses, require shading during sunshine; and it is particularly necessary in the case of the finer kinds of seeds sown on the surface. As these must first put forth their delicate little rootlets on the surface, an hour's strong sun would completely sap the life out of them. For frames, tiffany, thin canvas, or mats will serve; for a few dozen pots of seeds sown

in a hothouse, there is nothing better than a newspaper spread over the pots, and supported by their labels. Where a number of different kinds of seeds are sown together in a frame, many kinds will be an inch above the surface, and with perfectly developed leaves, before others have shown at all. Those that are well up should be taken out, leaving the shaded position to those not up, or in the act of vegetating.

Garden Enemies.

Quadrupeds.—Moles do considerable mischief to gardens at this season, by throwing up their hills in places where seeds have been sown; and also in lawns and grass-plots. In small gardens, moles are seldom met with, as such gardens are generally very full of plants, and the moles find a number of roots of trees and shrubs, growing closely together, form a serious obstruction to their runs. Where, however, there is an open space set aside for the culture of culinary vegetables, particularly those of the cabbage tribe, which require a great deal of stable manure, moles generally abound, as they are attracted by the earth-worms, which form their principal food, and which are always plentiful in recently manured ground. Where there are moles, the best way to remove them is said to be to lay leaves of the common elder in their runs, or to pour a decoction of elder leaves upon the mole-hills, the smell of the elder being particularly offensive to the mole. Mice have been already mentioned as destructive in gardens, and they are particularly so at this season, as they frequently devour the peas, and similar seeds, as soon as they are sown. To prevent this, soot should be lightly strewed over the peas or other seeds as soon as they are put into the ground, before they are covered with the earth, and this will prevent the mice from touching them, without injuring the crop; to which, on the contrary, the soot will form an excellent manure. There are several other modes recommended for preserving the seeds sown in gardens from the ravages of mice, the principal of which are the following,—steeping the peas, beans, &c., for twelve hours in a decoction of aloes, in the proportion of one ounce of aloes to a quart of boiling water, which should remain till it is cold before it is used; strewing the drills with sand; and rolling the peas in powdered resin: but perhaps the best method is sowing chopped furze along with the seed.

Birds.—Many birds in this month do considerable mischief to the gardens, and amongst the most destructive of these we may mention the chaffinch, the house-sparrow, and the hedge-sparrow. The latter birds are particularly injurious in small gardens, as they not only pick and scratch up all the seeds they can find, but they peck off the anthers and some of the petals of the crocuses and other spring flowers. In the neighbourhood of London they are particularly destructive, and they destroy the beauty of most of the early spring flowers as soon as they appear. The titmouse is very destructive in this month, and, in its eager search for the green looper caterpillars, it pecks off the calyx of the buds of some of the standard fruit-trees with such fury as to make them fall almost in showers to the ground. Generally speaking, the soft-bill birds, which are the best songsters, do rather good than evil to gardens, as they feed principally upon insects, and thus save much more vegetation than they destroy. As seed sowing is of so much importance, the following observations on the best way of protecting the smaller seed beds from birds may be useful to some. Most of our gardens are so closely associated with woods or shrubberies, that birds are a perpetual source of trouble at seed-sowing time, and some effective means of preventing their ravages at that season becomes very desirable. They generally root up and destroy more than they eat. The various popular modes of protecting seed-beds are not—to put it mildly—perfect. Few go so far as to add to the beatitudes of the garden the man of rags which our agricultural friends are so fond of offering for bird contemplation; but rags on lines are not nice, nor is it very pleasing to behold the ground netted over with thin twine. All loss and trouble may be entirely prevented, so far as the seed-bed is concerned, by the adoption of a very simple contrivance—a rough frame, about 4ft. wide and 6ft. or 7ft. long. This is to be covered with galvanised wire netting. As soon as the seeds are sown this frame is placed on the bed, and all is safe. A series of these frames would be required for a large place, and would soon more than repay for the cost of their construction, which is slight, but the amateur who has but a small quantity of seeds to sow will find the plan particularly valuable. All seedlings which bear transplanting should be raised under these frames, and they might be made useful for protecting many other tiny garden crops. Indeed, so much annoyance is frequently caused by birds, that it may be worth while to sow some crops in

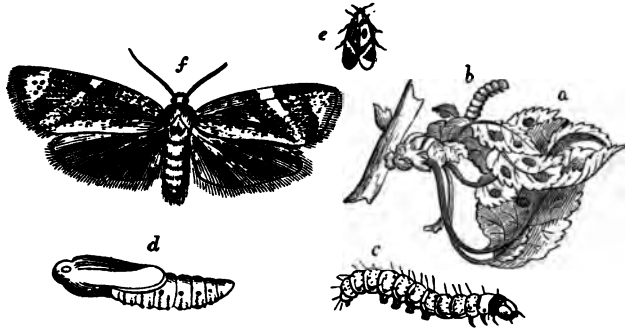
seed-beds which we are not in the habit of raising in that way—so perfect is the protection afforded by the shallow frames covered with galvanised wire. Care should be taken to provide the small-meshed netting for this purpose, as it is indispensable that the smallest sparrow be kept out.

As many birds make their nests at this season, it may be interesting to describe the appearance of those generally found in gardens. The nest of the blackbird is generally found placed in a thick bush or against the side of a bank. It is very heavy, being principally composed of wet clay, lined on the outside with moss or fibrous roots, and on the inside with dry grass or hay. There are four or five eggs, which are of a dingy colour, and which look smeared over with pale brown spots, mostly at the large end. The garden thrush also makes its nest in March, and the nest itself, which greatly resembles that of the blackbird, is so compact as frequently to hold water. The bird lays four or five blue eggs, spotted with black at their larger end. The hedge-sparrow also makes its nest in March of green moss and wool lined with hair. The eggs are four or five in number, and of a beautiful blue. The house-sparrow generally builds under the tiles of houses or in similar situations, and when it builds in a tree it is usually at some height from the ground. It generally lays six eggs, which are rather dark, and speckled all over with a dusky brown or ash grey. The chaffinch builds generally in apple trees, particularly if they are old and covered with moss. It is also very fond of hawthorn bushes. This bird lays four eggs, which are of a dingy white, marked with streaks and spots of dark purple. In the summer chaffinches live principally upon insects, and it is only in winter and spring that they are injurious in gardens.

Insects.—As the buds of trees begin to unfold, various kinds of insects appear, to feed upon them, both in the caterpillar and the perfect state. The peach aphid appears one of the first, and it is seen upon the trees when the buds can scarcely be distinguished. As soon as the scales of the buds begin to crack, the aphides cover them, and, thrusting their rostrums into the young tender leaves, they suck out the sap, which is at that time very sweet. When the young buds of the apricot swell, early in March, their opening sometimes appears to be prevented by a number of fine threads with which the scales of the bud are fastened together. After the lapse of a few days, however, particularly if the weather chances to be

warm and moist, the growth of the leaves proceeds, though their extremities are still tied together so as to cause the stem to bend, and the leaves themselves to form a curve (see *a* in fig. 23). In the "Gardener's Magazine," Mr. Westwood, describing the caterpillar of the apricot bud, after mentioning the manner in which the

FIG. 23.



The Caterpillar of the Apricot bud, in its various stages.

points of the leaves are fastened together, tells us, that within the retreat thus formed, and which generally encloses the flower-bud, an insect will be found to have taken up its abode; a small slender caterpillar (*Ditula angustiorana*), about half an inch long (see *b* in fig 23), which, when it has nearly assumed its full size (*c*), is "of a pale yellowish-green colour; the extremity of the body being of a pale yellow; the head, very pale brownish yellow-coloured and scaly, as well as the first and following segments of the body, which are of a semicircular form, with a black mark at each of the posterior angles; the eyes, the penultimate joint of the antennæ, and a spot on each side of the head, black. The body is in general of a fleshy consistence, with transverse impressions near the articulations, and with lateral tubercles. A few short hairs, or, rather, slender bristles, are scattered over the body; the three segments after the head are furnished with as many pairs of articulated feet; the fourth and fifth sections are destitute of organs of locomotion; the four following segments have as many pairs of short prolegs, and a fifth pair of these organs is placed at the extremity of the

body. This caterpillar is very active in its motions, writhing about from side to side, and twisting its body into various curves when disturbed; it also crawls both backwards and forwards, and will let itself down from a considerable height by a single thread attached to its mouth. Ordinarily, however, it keeps itself concealed within its green abode. Its presence may easily be detected by the withered and gnawed appearance of the leaflets, which, when dead, still cling together by many of the silken threads with which they are attached, and which are generally found about the twigs, with the withered petals of the adjacent blossoms. When the caterpillar has attained its full size, it has not far to go, nor is much labour requisite for the construction of its cocoon. It attaches the remnants of the leaves together slightly with threads; or, if it has previously made its way to a younger fuller-grown leaf, it rolls it partially up, fastening it with threads, and in the midst of this retreat it casts off its caterpillar skin, and becomes a shining brown chrysalis (*d*), very similar in its form to that of the moth of the rose tree. The back of the abdominal segments is furnished with five spines directed backwards, two rows being placed on each segment, and which are employed in pushing the chrysalis through the slender barriers of its cocoon, when the time has arrived for the bursting forth of the perfect insect." This takes place in the month of July, at which period the narrow-winged red-bar moth (*e*), as it is called, may be seen flying about the apricot trees when the leaves are disturbed. A magnified representation of the insect is shown at *f*. It is not known where this moth lays its eggs, but it is supposed to be on the branches of the apricot tree, in which case they must be covered by some glutinous substance to preserve them during the winter, as the caterpillar does not appear till the spring.

APRIL.

General Observations and Directions.

The Weather, &c.—The month of April is generally marked by uncertain weather, with frequent rains followed by warm sunshine, which occasions a rapid growth. The word April is said to be derived from the Latin verb *aperire*, to open, because in this month the earth opens, and vegetation of all kinds comes forth. There is an old legend that the first three days of April are borrowed from March, and they were anciently called the borrowing days, though some writers assert that the borrowing days were the last three days of March. At any rate, the last three days of March and the first three of April are frequently very stormy. In this month the wind is said to blow oftener from the east than from any other point. Towards the end of the month, the weather is often dry, clear, and warm; and when there are showers they are generally very short, and are succeeded by warm sunshine.

Open Garden.—In gardens enjoying a pure air and tolerably free soil, and where spring flowers are at all looked after, there should now be a vast amount of interest and charming colour, and the flowers should continue to increase in beauty till the summer ones come in to take their place. Should there be any time to spare from the kitchen-garden, it might be advantageously given to the planting of hardy bedding and edging plants in the flower-garden, &c., and now is about the best time to perform the work. It should be borne in mind that, as a rule, all such subjects should be moved annually, as, if not, they are apt to get too gross, and, moreover, if they be flowering subjects, like pansies, they flower all at once if old-established plants, whereas if young ones they keep growing and flowering on all the season. Planted out about this time, the kind of pansies known as Cliveden pansies, flower well through the summer. The annual planting into fresh ground, which is necessary

with tender bedding plants, is one of the chief causes of the flushness of vigour which they usually display, and the fact should be remembered in dealing with hardy subjects for flower-garden use, the culture of which is happily increasing every day. Annuals may now be sown with safety, reserving, however, delicate kinds like *Rhodanthe* till the end of the month. In dry weather recently transplanted shrubs may depend for their existence upon a thorough watering, slight dribblings of water are worse than useless. Mowing and rolling of the turf will of course now be in full swing, while the vicinity of the spring flowers should be kept trim and neat as may be.

Prick out the earliest celery, if not already done. The handiest and best way is, if you happen not to have any old unoccupied hotbeds about, to place rotten manure a foot thick or so upon the ground, a few inches of fine rich sifted soil over that, then prick in the plants a few inches apart each way, protecting them with hand-glasses for some little time to come, or even covering them with a mat thrown over bent sticks arched over the beds. Succession crops of small saladings; American cress, basil, beans, red beet, borage, brocolis (the early kinds), burnet, such cabbages as *Vanack* or *Fulham* for autumn use, cardoons, carrots, cauliflowers, celeriac, celery (for the latest crop), chicory (to be dug up in the autumn and blanched: it is then the *barbe du capucin* of the French), kidney beans, leeks (if not already sown, and in any case for a late crop), lettuces (white *Paris cos* and *Neapolitan* cabbage), marjoram, nasturtiums, parsley, peas, purslane, radishes (frequently), salsify, summer savoury, scorzonera, spinach, and turnips, should be sown during this month, or any of these that we care to grow and have not already sown. In sowing cabbages, &c., just now, it will be well to remember that the *Dalmeny* sprouts and *Albert* sprouts, and the true *Cottager's* kale, are excellent kinds, that survive severe frosts where other and older varieties perish. Of the smaller kinds of cabbages, *Shilling's Queen*, *Veitch's Improved*, and *Early Dwarf York*, are among the best. If the *Walcheren* cauliflower and the brocolis for autumn are not sown, they should be put in at once. Cauliflowers should, by this time, be planted out in abundance. Early potatoes that have made their appearance should be protected by drawing a little earth over them with the hoe. Weeds will put in strong claims to be considered spring flowering plants if not looked after at this season, and if allowed to reach this stage

they will deposit as much seed as will suffice to crop the garden for the summer.

Indoor Department.—About this time the shading for the show-house must be thought of, if that be not already arranged. All flowering plants should be preserved from strong sun, and kept well watered, and the house in which they are cool and pretty moist, so that the bloom may not fall off quickly. Thorough watering, liberal potting, and perfect cleanliness are the essentials to success, generally speaking. A great deal of nonsense has been written about not giving plants too much water, and pernicious nonsense, because it has led to the death of a great number of good plants all over the country, notably the curious and beautiful race of cactuses, which were literally dried out of the country in a great many instances. If a plant be well potted and drained you cannot well give it too much water at its growing season, and at this season the safest plan is to water every healthy, free growing pot plant twice in succession, so as to make sure of thoroughly saturating the soil. All young bedding plants, &c., should now be near the glass in their various structures, well supplied with water, and making free growth, while the potting off of cuttings, &c., will require attention in every garden in which bedding is carried out to any great extent. Camellias will now be beginning to push forth their young growth; keep them in intermediate temperature, if convenient. What is meant by that, is a house something cooler than stoves are kept. When planted out in a conservatory, or cool house, they usually make capital growth without any addition of heat; but when grown in pots it is better to let them have it, if convenient, also light shade, not forgetting that when a plant is "making its growth" it should never lack abundance of moisture. Greenhouse plants, and particularly New Holland plants that have flowered freely, should be cut back to the stiff budding wood, and encouraged to grow in a moist atmosphere; standing in a pit or frame on a moist bottom of coal ashes, sand, &c., they thrive nicely. A great many things may now be removed from frames, pits, &c., into the open air, and there either fully exposed, or protected at night with mats over rough arches of sticks, while into the pits many things may be introduced from the greenhouse—a convenient movement at this season, as many specimens will require increased room from fresh pottings and increased growth.

Those who have already raised choice hardy and perennial sub-

jects, should now be gradually inuring them to the weather, and also potting them off and thinning them out, to prevent that wholesale damping off which frequently occurs with overcrowded seedlings. Seedlings of greenhouse plants should be kept near the glass and light. Sow the *Rhodanthes*, *Clintonia pulchella*, &c., early in the month. Fuchsias should be growing rapidly just now, and be liberally treated; dahlias divided and potted; and things generally given free room for development when growth is at its best.

Wherever any "forcing" is carried on there ought to be good crops of strawberries, kidney beans, &c., and the picking of these at the right moment is worthy some attention. The strawberries are not likely to be neglected in that respect; but by allowing any of the beans to seed or get beyond the edible state before picking them, the crop is of course considerably weakened, or rather its strength permitted to run to waste. All crops forced in pots should have plenty of water, should be thoroughly watered in fact, and will be very much the better for an occasional dose of clear and well diluted liquid manure made from sheep droppings. It is better applied when the soil is rather moist, never when it is very dry. In those houses devoted to forcing and growing the larger subjects, such as peaches, vines, &c., the finger and thumb should be busy now, disbudding and stopping the shoots, tying in growths that require support, and thinning grapes. It is a very bad plan to leave the spray or shoots on such plants till they are half run wild, and then go in for a wholesale shearing; and one which is only excusable in the greenest of amateurs. All this kind of work should be done gradually, gently, and with care. In tying, the branches should be handled very tenderly, the ties be rather loose, and of soft bass mat. In the orchard house plenty of air should now be given, and the trees, whether in pots or borders, be thoroughly watered.

Cucumbers for ridging out in the open air should be sown at once, and the various kinds of gourd which have been shown to such advantage of late years and much admired, should also be sown; they will have plenty of time to become sufficiently developed and ready for planting out in good time. They should be sown on a gentle hotbed. It is a bad thing to have such things become stubby and old before planting out in consequence of being sown too early. Insects will probably now begin to do ruinous work both indoors

and out, if not effectually destroyed as soon as they begin to show themselves.

Things not to be done in April.

Never plant climbing or wall plants that are very difficult to keep free from vermin against the walls in conservatories, stoves, or green-houses.

Never allow birds to scrape away and destroy all your seeds, but place all the seed-beds together, so that netting may be conveniently stretched over all.

Never wait for crops of weeds to become large and imposing-looking before hoeing the ground. Hoe the general surface of the garden every second week whether weeds can be seen or not, and have all the seed-beds, &c., that cannot be hoed picked as often, and it will be found less troublesome and less laborious to keep a garden thoroughly clean than excessively dirty!

Never allow the aphides to appear on peach trees without immediately destroying it with tobacco or quassia water.

Never commence the sowing of annual plants, &c., packet by packet, but sort them carefully into sections according to hardiness, the position they are to adorn, and in all cases write the labels distinctly indoors, which will much facilitate the sowing.

When sowing seeds in pots, and propagating from cuttings, never leave the preparation of soil, filling and draining of the pots, &c., till you are ready to sow your seeds or perhaps have your cuttings brought into your potting shed, but in all such cases have the proper soil prepared beforehand, the pots (clean) properly drained, filled, and surfaced, so that you have nothing to do but sow the seeds or insert the cuttings. In spring and autumn a few dozen six-inch pots should be ready in the potting shed at all times, and also a few labels. Attention to such points as these removes many of the difficulties of the amateur, or even of the practical gardener.

Never sow such important and popular annual plants as asters, stocks, African and French marigolds, and indeed all good annual plants used for flower-garden use of any kind in pots, if there is an opportunity of doing so on a bed of fine earth spread in the bottom of a shallow frame or on a very slight hotbed. When sown thus they grow more quickly, and are in a far better condition to plant

out, than when crowded in small pots and pricked out. Sown thinly in lines in the frames, they may be transferred directly to the open border some moist, cloudy day, and watered directly, will receive no check. Even where no heat from stable manure can be afforded, it is a better plan to sow such seeds in very shallow frames, with a few inches of soil spread over the ground they cover, than to use pots. When the plants are up in the frames give plenty of air, and finally expose altogether by taking off the lights.

In dealing with hotbed frames of cuttings, as a rule do not close up firmly at night and give air during the day. Rather keep close during the day, when evaporation is excessive, and give a little air at night, when too much warm moisture is likely to gather in the frame.

Do not postpone the making of the plan for arranging the bedding plants beyond this month. The stock of bedding plants can now be ascertained, and all necessary arrangements made.

Do not forget that many of the edging plants, &c., now in use, *Cerastiums*, *Sempervivums*, and *Dactylis*, for example, are perfectly hardy, and that it will be most unwise to defer planting and re-arranging them till the very busy time of putting out all the bedding plants arrives.

Never allow annuals to grow too thickly; nothing relative to annuals requires more attention. Thin according to the height; if a branching plant, growing a foot or eighteen inches high, remove all but three or four in a patch; and in the very dwarf sorts, not more than six or eight plants should be left.

Never allow the cuttings struck in pans or pots to remain in them so long as to get the roots matted.

Never allow climbers in a conservatory to become a mass of wood and foliage, so as to require a severe pruning during the summer: regulate, thin, and tie the shoots as they grow.

Principal Operations in April.

Disbudding trees in the Fruit Garden.—Disbudding is depriving the shoots of a tree of part of its buds just as they commence growing, or when the first leaves are partially developed. The last week in the present month, and the first fortnight in the next, form a very important period in the management of peach

and nectarine trees as regards this operation. Healthy trees will produce many more shoots than are required; therefore the sooner they are relieved of this superfluity the better, for if allowed to grow until the latter end of May, cutting them out would injure the tree by depriving it of so large a quantity of foliage at one time. If wall trees are carefully attended to by disbudding and summer pruning, which is by far the best season for this operation, they would require very little winter pruning. In order to describe as far as it is possible what buds should be left, and what should be removed, in a healthy tree, we must imagine a tree well filled up; that is, with branches equally distributed upon the wall, and quite thick enough; and we will now take a previous year's shoot, and suppose it to have no flower buds upon it. In this case it will be necessary to pinch off with the thumb and finger all the shoot buds, except the end one, and the one nearest the base of the shoot; this one at the base may be left either on the upper or under side, according to where there may be the most room for the branch it will be likely to produce. Some gardeners, however, think it better to remove the buds with a sharp small-bladed knife, taking care to cut close to the branch, but not into the bark. Where there are flower buds between the end of the branch and its base, they are generally accompanied by a young shoot; this shoot should be allowed to grow two or three inches long and then be pinched off at the end, leaving only four or five leaves to shade the fruit. Where a greater quantity of shoots is required to fill up than those left, intermediate ones must be laid in, that is, nailed against the wall; but as a rule no fore-right shoots (those growing on the front of the branch) should be laid in.

General Management of Fruit Trees.—The fruit of most of the peaches, nectarines, and apricots will now be set; but the trees should still be protected from the alternations of frost and sunshine, to which they are subject at this season, taking care to allow them abundance of air in the middle of the day. Dead shoots should be cut off fruit trees at this season, particularly from apple trees, as the dead shoots are generally cankered, and if they are not removed the disease will spread. It is recommended, indeed, to cut away the branch two or three buds below what appears to be the diseased part of the tree, as the heart-wood, or centre of the branch, is often found rotten when the outside of a branch appears healthy. The branch should be cut off to a part where the wood appears per-

fectly sound and healthy ; and it is also necessary to pare off with a sharp knife the diseased part of the bark. Grafts that were put on in March should now be examined, and if the clay has cracked or fallen off, it should be replaced ; and if any shoots have risen below the graft they should be taken off, as they rob the graft of its nourishment. The mastic recommended will not crack.

Strawberry beds should now be cleared of weeds, and all the runners should be removed, unless any should be required for new plantations, in which case some of the earliest-formed runners should be preserved, and left on the plants till they are wanted to form the new beds in June. The beds should then be raked between the plants, and covered with the mowings of the lawn to keep out drought ; and this will be found far more beneficial than continued waterings.

The practice of mulching or covering the ground between rows of strawberries with litter or grass is so beneficial, that all who care for their strawberry crop should take care that it is done every year about this time. It is not only effectual in preventing the fruit from being coated with grit and mud, as it would be if allowed to lie on the bare soil, but also in keeping the soil moist and open, and thereby assisting the full development of the fruit. Of the materials employed for this purpose long litter is perhaps the best, and most readily obtained by readers: in the absence of this, lawn-mowings will do very well, and so will spent tan.

Gooseberry bushes may be pruned in this month. In some books on gardening it is directed to prune them earlier ; but unless the season be very forward it is generally found advisable to wait till the first week in April, when the leaves are just beginning to unfold, as birds are very apt to pick the buds off ; and when the bushes are pruned too early, the branches that are left will sometimes be found completely stripped of their buds by these feathered thieves. Where however birds do not injure them, they may be pruned any time during the winter. In pruning the gooseberry, the branches should be kept thin ; the end shoots of the previous year should be shortened a few inches, if they curve downwards, or a greater supply of young wood is desirable ; if otherwise, they may be allowed to remain at full length. All the side shoots from the main branches should be cut to a bud or two at the base, unless more main branches are required, when the best-situated shoots may be left nearly at full length. Currants are best pruned in autumn. When the gooseberry bushes

have been pruned, the ground between them having been generally trodden hard by the pruner, it should be forked over to admit warmth and air to the roots; but previously to doing this, if the bushes are subject to the attacks of the magpie-moth, it is considered advisable to sprinkle the ground over thickly with fresh-slacked lime, and to fork it in, to prevent the ravages of the caterpillars of that destructive insect.

Transplanting and Thinning.—In the kitchen-garden the principal work to be done in this month consists in thinning and transplanting the young plants growing from the seeds that were sown in March. Lettuces should be transplanted into a rich and sheltered border; they are best taken up with a trowel, so that as much earth as possible may adhere to the roots, and the hole into which they are to be put should be made with a trowel likewise, because, if made with a dibber, the earth will be pressed firm on the sides, and be more difficult for the roots of the transplanted lettuces to penetrate. The lettuces are to be about ten or twelve inches apart every way, and great care must be taken in planting them, not to bruise either the succulent leaves of the young plant or its tender roots. The plants should be watered immediately after they are transplanted, if the soil be dry; and if the weather continue fine, the watering should be repeated once or twice a week till the plants appear to begin to grow. Indeed, if the watering is continued during the whole growth of the lettuces, provided the weather be dry, the cultivator will be well rewarded for his trouble by the improved succulency of the plants. The lettuces that were planted late in autumn should now have the soil between them loosened, by slightly digging it with a fork. Beds of radishes should be thinned out, leaving the plants two or three inches asunder, but the plants drawn out are not worth transplanting. The spinach that was sown in March should be thinned, so as to leave the plants from six to nine inches apart, as, if this is neglected, the plants will probably be drawn up to seed without producing any leaves worth gathering. After thinning, the remaining plants should be hoed up. The seekale sown in March should now be thinned, so as to leave the plants twelve inches apart, and the plants taken out may be transplanted to beds in an open part of the garden. The beds should be two feet and a half wide, and dug out fifteen inches deep; and if expense is immaterial, the space dug out may be filled with sea or river sand, so as to rise two

inches higher than the surface of the ground, or it may be filled with seaweed, sand, and earth mixed. It may be observed, that sand is too expensive for general purposes, and not requisite; but seaweed or salt is always beneficial. Along the middle of each bank a drill should be drawn, just deep enough to take in the roots of the young plants, which should be placed about twelve inches apart. The cabbage, savoy, and cauliflower plants, the seeds of which were sown in March, should now be thinned, and those that are taken out planted in other beds. All the other young plants raised from seeds sown in March should now be thinned and transplanted, excepting carrots and parsnips, and all other plants having spindle-shaped roots, none of which will bear transplanting.

Culture of the Barbe de Capucin.—This salad, so very popular in Paris during the winter and spring months, is simply the blanched leaves of the common chicory (*Cichorium Intybus*), and is grown in the following manner. The seed of the common chicory is sown in April in a sandy light earth. It should be sown thickly, and in lines, so as to get long and thin roots. To force it a bed of hot dung four or five inches deep is made in a well, closed cellar in autumn. As soon as it has begun to cool,—that is to say, after twelve or fifteen days—the plants are taken up, the roots well cleaned, and replanted in bunches twelve inches in diameter, leaving between each bunch a small space that is afterwards filled up with dung. As soon as the leaves begin to grow, which generally happens in about ten or twelve days, according to the heat of the cellar, they are lightly watered with a fine rose, the water being, as nearly as possible, at the same temperature as the cellar. Every cranny should be stopped up, so as to prevent the smallest portion of light from entering, as well as to keep the place warm; the door even should be covered up with long dung, which may be removed whenever it is necessary to enter. The most important thing to attend to is the maintaining of a proper degree of heat and humidity in the cellar. If it is too damp, the leaves, which are very tender, will rot away; and if too dry, they will not develope with sufficient rapidity, which is the very condition upon which its tenderness and good quality depend. As soon as the leaves are sixteen or twenty inches long, the bunch of plants is lifted from the bed, the roots are trimmed, and the whole divided into smaller bunches for market. Another crop is then commenced in the same cellar, taking care to stir up the bed, and sprinkle a

little fresh dung over it, or even renewing it if it is worn out, after which new tufts are inserted, and grown as already described. Sometimes several crops in different stages are grown in the same cellar, some beds containing plants just putting forth their leaves, while in others they are almost ready for market. Nearly the whole of the Barbe de Capucin sold in the Paris market comes from the peach gardens of Montreuil-sous-Bois, their proprietors sowing a large part of the plain extending from Bagnolet to Vincennes with this plant, which is afterwards forced for winter use.

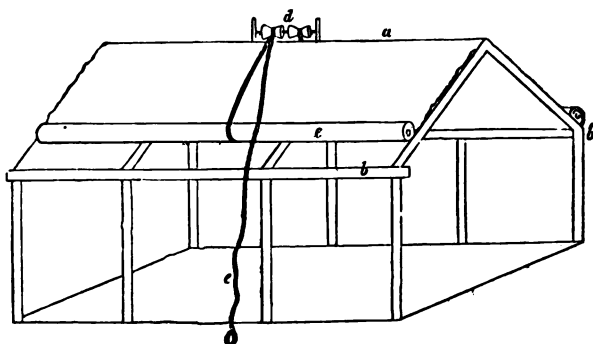
No salad may be made more useful to the amateur than this during winter. Instead of blanching it in a cave he can do so in any dark place in a hothouse, or pit, or wherever the rhubarb and seakale are forced.

Ridge Cucumbers.—The seeds of cucumbers should be sown about the middle of April in a cucumber or melon bed, and when they come up the young plants should be potted out into small pots, two or three plants in each pot, kept properly watered, and stopped at the first or second joint. These cucumbers are intended for planting in the open air in May. Sometimes the cucumbers intended for pickling are sown in the open ground in April; but when this is the case, they must be sown in rich ground, in a warm dry situation, in front of a south wall. Some gardeners recommend preparing the soil in which cucumber seed is to be sown in the open ground by digging it over and leaving it exposed to the heat of the sun during the day, so that it may absorb heat from the sun's rays, and then covering it with mats at night, so as to prevent the radiation of the heat, as in this way they say a quantity of heat is accumulated in the ground. The best way to grow cucumbers in the open air is to place them on a slight hotbed, sunk in a trench in the ground, planting them out under hand lights till they are established, and till danger from cold is past.

Hyacinths, tulips, ranunculuses, and anemones, which are now coming into bloom, should be screened by a covering of hoops and mats, so contrived that the hoops may be kept constantly over the beds, and the mats drawn on or taken off as it may be necessary. It is generally advisable to take the mats off for a short time every day in the morning from nine till eleven o'clock, but the mats should be drawn on again in the middle of the day, when the sun has

much power. When the tulips have grown too high for the hoops and mats, a wooden frame may be erected over them (see fig. 24), covered with awning, which may be drawn up or let down at pleasure. In fig. 24, *a* shows the principal rafter, to which the

FIG. 24.

*Awning for Tulips and Auriculas.*

canvas is attached, extending on both sides, when let down, to *b*. There is a strong roller (*c*) at the edge of the canvas, and a cord is fixed to the under side of the roof, which is brought round the roller *c*, and over the canvas to a pulley at *d*, so that by drawing the cord *e*, the canvas is rolled up by the roller *c*. By the use of a similar cord on the other side running in a distinct pulley at *d*, either side of the awning may be pulled partly or wholly up, as circumstances may dictate. This frame may be used also for auriculas. It is, however, well to add that this precaution is usually only taken by florists who exhibit, or require the exhibiting florists' standard of perfection, and that these flowers may be enjoyed in the open garden without any canopy.

Auriculas will now begin to flower, and they require even more protection than hyacinths and tulips. One of the chief beauties of a good auricula is the kind of mealy dust which is spread over the limb of the corolla, and this is not only easily washed off by the rain, but it may also be blown away by the wind; and it is said to disappear if the plant is exposed for any length of time to the full

heat of the sun. For these reasons it is judged necessary to shield auriculas as much as possible from the effects of the weather; and they are therefore generally placed on a stage or stand formed of wood, and raised on four strong posts. The stand should have from three to five ranges of shelves, each about six inches wide, and placed receding backwards, like the seats in an amphitheatre, so that all the plants may be seen at once: and it should have a roof, made sloping to throw off the water, the back being generally placed against a wall or some kind of building, while the front and sides are furnished with curtains, to draw up or let down at pleasure. The plants should be carefully watered every day; but the greatest precaution should be used not to permit the water to touch the flowers.

Plant Houses.—In the Greenhouse a little fire heat should be occasionally applied, and plenty of air given at the same time to prevent damp. The plants that are coming into flower should be watered daily, and syringed every other day during fine weather, until the flowers expand, when syringing overhead should be discontinued. As many plants as possible should be removed out of the house, and put into cold frames, so as to allow those that are retained in the house as much room as possible, not only to allow them space to grow, but to keep round them a free circulation of air. Air should be admitted all day if the weather is neither too wet nor too cold, and the windows may even be left open a little all night if the air is not frosty. In the conservatory no fire will be required except in the morning to dry up the damp. Plenty of air should be admitted if the weather is warm and tolerably dry. The watering of a conservatory is an important point of culture at this season, as the plants are injured either by having too much water or too little. The borders should be frequently examined below the surface, and if they are found dry they should be watered freely. If, on the contrary, they are soddened with moisture, a portion of the earth should be removed, and the place supplied with fresh earth. In the forcing-house or pit the thermometer should be kept to about 65° during night, and from 10° to 15° higher during the day, admitting air when the temperature has risen 5° above that of the night. The plants should be syringed twice a day—early in the morning, and about three in the afternoon; and if the pit is heated by flues, water should be poured on them to create a steam. Great care should be taken in the management of

this house as regards water, as enough should be given to keep up a moist heat, but without soddening the soil. Many plants that have been dormant during the winter will require repotting during this month. The plants which are coming into flower should be removed to the greenhouse or the conservatory.

In the Vinery, when the grapes are set, the bunches should be looked over and thinned. It is rather difficult for a person not accustomed to plants to know when vines are in flower, as the flowers are green and inconspicuous; and when they first form they look like a number of little berries; by degrees, however, the upper covering of the apparent berry becomes detached from the lower part, and is pushed upwards by the stamens, which, when it falls off, spread outwards. This upper covering, which is pushed off, consists of five petals attached together, so that when it falls nothing is left of the flower but the pistil and stamens; which wither as soon as the pollen is matured and has done its office. When therefore stamens are observed on the panicle of the vine, it is a sign that the fruit is about to set, and the house should be kept rather closer shut up than usual, as the stamens require heat and dryness to make them expand and shed their pollen. The quantity of bunches to be left on each vine must depend upon its size; if single, a stem is trained to each rafter, from twelve to twenty bunches may be left. Immediately after thinning the bunches, the vines should have a good syringing, so as to wash the fallen stamens from the berries; but after this, the vines should not be again syringed. Where artificial heat is used, it should now be increased to 80° during the day, and from 65° to 70° at night. Where grapes are grown in greenhouses without artificial heat, they have probably not begun to show flower buds at this season; but as soon as they do so, and the flowers expand, the plants should be treated in the same manner as directed for vines in a forcing-house.

The Ground Vinery.—The beginning of April is as good a time as we can select for the planting of vines, and the useful and simple contrivance called a ground vinery is likely to engage the attention of many an amateur. The best ground vinery is the barless ground vinery, so called from being glazed with a single row of large panes of glass without any sash-bars, as in the original ground vinery. To permit of slipping in the glass with ease, a rather deep groove is made at the top, into which the glass slips and falls back again into its appointed bed, and no putty is used except at the

bottom, the panes fitting closely to each other. One side of these vineries does not open with a hinge, as in the patent kind, but being made in seven-foot lengths, there is no difficulty in quickly taking them off when anything requires to be done to the grapes, and that is only likely to happen at wide intervals, when they want thinning or the shoots stopping. Ventilation being free, and syringing or watering not being required, it will not often be necessary to take off the vinery from the bricks, which raise it a little from the earth. They are much neater looking than ground vineries with bars, while of course the flow of light to the vine, or whatever may be inside, is perfectly uninterrupted.

Mr. Rivett, Railway-bridge, Stratford, Essex, is the maker of these, and the scale of prices is very reasonable indeed. The frames are usually sent by goods train, and the glass packed in boxes; but the manufacturer informs us that some people get their own glass and glaze the frames, as the glass may be obtained in some places as cheaply as by having it sent from London. To send the frames glazed to any distance would of course be anything but wise, and they would most likely all get broken; but to places immediately around London, or within easy distance of the manufactory, they could be sent with safety; though here too it is doubtful if it would not be better to send the frames unglazed, and have them finished when placed in position, as the panes are large.

Apart from grape-growing, even in the largest gardens in the land, they will be found most useful during our wretched winters and cutting springs, for the protection of such things as small saladings, &c., and not a few other uses which will soon suggest themselves to the amateur when once he makes the acquaintance of this simple ground vinery. Parsley, for instance, is often taken up and potted, to insure having a supply in case of hard weather; but placing one of these over it will quite suffice for the usual run of our winters, while numerous batches of seedlings and half hardy things will be the better for the protection of the ground vinery. They may be taken off the vines when the fruit is gathered and wood ripened in autumn, if it be desired to do any of these things with the ground vinery. Strawberries may be nicely advanced by placing one or more ground vineries over the rows, which their size just adapts them to fit. They seem, in fact, as well adapted for gently forwarding the strawberry as for the fruiting of good grapes without artificial heat; and the longer we can prolong the season of

the strawberry the better. Lettuce, and endive too, in winter will be very thankful for protection, and with the aid of the ground vinery (by keeping snails and such vermin from devouring them) we may enjoy good salad, which in winter is usually only for those who have pits and frames to spare, and who, moreover, manage them well. The engraving represents two ground vineries, each seven feet long, two feet six inches wide at base, and the glass twenty inches deep at each side. The open aperture at each end provides,

FIG. 25.

*The barless ground vinery.*

with the wide openings all round between the bricks, quite sufficient ventilation at all times. When the structures are placed in twos, in this way only one end of each need be filled; and this is likely frequently to be the case, as the vine which fills one will soon fill two, or even more if it be desired.

One thing would be a considerable improvement in the arrangement of ground vineries, though it is not practised by any of those who use them, and that is to place the frame on complete rows of the common drilled or perforated brick, instead of on isolated bricks. Sufficient ventilation would flow through the holes in the brick, and rats, birds, &c., would be effectually excluded. As we have seen the vineries arranged, these things have full opportunity to do as they like. We have seen rats climb up straight trellises against a brick wall and cut down fine bunches of grapes as readily as monkeys could; and it is not to be hoped that they will spare the grapes when once they discover them in one of these simple structures. The floor of the vinery should be covered with large slates. The following are the prices:—No. 1 (the usual size), 7 ft. long, 2 ft. 6 in. wide, 1 ft. 3 in. high inside, woodwork, 5s. 6d. each; 21 oz. glass

and putty, packed, 7s. 6d. each. No. 2 (larger size, for two vines), 7 ft. long, 3 ft. wide, 1 ft. 6 in. high inside, woodwork, 6s. 6d. each; 21 oz. glass and putty, packed, 9s. 6d. each. Painting, 1s. 6d. each; closed ends, 1s. each. It should be added that these ground vineries are so simply made that any village carpenter should be able to construct them.

As to the culture of the vine in the ground vinery it is precisely the same as the culture of the vine against a wall or in the cool vinery, only that the shoots instead of being trained overhead or vertically, are trained one in the middle of each vinery, either pegged down between the interstices of the slates used to cover the bottom, or trained on a wire running from one end of the vinery to the other, and at about four inches from the ground. This last is the best plan. When any stopping of the shoots or thinning of the berries is required the vinery must be lifted, but this is easily done. In winter or spring when not in use over the vines, if the ground vineries be removed for use over other crops, the vines should be protected with litter.

Shading Glass-houses, Frames, &c.—It is of great importance to use some permanent shading for every kind of glass structure that will permit of it; the trouble of shading with mats, canvas, &c., being excessive. Apart from this the permanent shading is the safest and the best. According to Mr. W. P. Ayres, an excellent authority, "The best permanent shade for plant houses is linseed oil and sugar of lead, in the proportion of about a teaspoonful of the lead to a quart of oil; but the exact tint must be governed by the amount of shade required. Therefore apply the paint gradually, and prove it upon a few pieces of waste glass until you get the tint desired. First wash the glass thoroughly clean, and then (having previously prepared the oil and lead), on a dry clear morning, take it and paint as thinly as possible over the glass with an ordinary paint brush; then follow with what the painters call a dust brush, loose and quite dry, and dabbing it gently on the oiled portion, impart a frosted or ground-glass appearance to it. An ordinary garden labourer with a little practice will do this very nicely. This shading will stand very well for a season, and if in the autumn it is desired to remove it, that may be readily done by washing with strong pearlash water. For some plants, such as camellias, oranges, and other strong-foliaged things, it is questionable whether it is desirable to remove the shading. Many years ago,

when there was much bother about the scorching by foreign, sheet, and other inferior kinds of glass, Mr. Pince, of the Exeter Nursery, who a short time previously had put up a large camellia house, wrote to a friend: 'I made short work of the scorching; I painted the glass all over with white lead paint, and I found where the paint was the thickest the plants did the best.'

Garden Enemies.

Birds.—Various kinds of nests are still to be found in gardens; as many birds do not build till the latter end of March or the beginning of April. The tomtit's nest is made in a hole in a tree or wall, and it contains from six to eight small white eggs speckled with rusty brown at the larger end. The linnet often builds in a gooseberry bush, or double furze bush, and it lays four eggs, which are of a bluish white, with a few purplish specks and lines. The robin redbreast has rather light-coloured eggs, with red specks; and the eggs of the nightingale are very dark. The nest of the bullfinch is generally made of flexible fibrous roots, twisted slightly together; and the eggs are four in number, of a bluish white, speckled, and streaked with purple, rather larger than those of the linnet. Birds do comparatively very little mischief in the gardens in this month, as they seem almost entirely occupied in feeding their young with insects. The young blackbirds are particularly voracious.

Insects are most destructive in this month, as by a wise provision of Providence they are produced in the greatest abundance when the number of young birds that are hatched in early spring require the greatest quantity of food. Insects also feed most easily upon quite young plants, as when the cellular tissue is first developed, the epidermis is of a very slight texture and easily pierced; whereas age makes it too hard and tough for the delicate organs of many insects to penetrate through it. In this month if the buds of the rose trees are examined just as the leaves are beginning to unfold, a little brown speck will be found attached to them here and there, looking like a seed. This is a little case which conceals the larva or caterpillar of a very small moth (*Tinea rhodophagella*). The larva is very destructive, and when it has devoured one leaf it removes with its case to another. It is very small, being only a few

lines long, and yellow, with a black head, and a ring of black spots round the body near to the head. When it goes into the pupa state, it only enlarges a little the case in which it lived while it was a caterpillar. The moth is very small; its body is of a silvery grey, and its upper wings are covered with small black dots. This caterpillar is most troublesome in the flower-pit, where it appears on rose trees in pots which are intended for early flowering; but though it is not a native of this country, it is now frequently found on rose trees in the open air.

The caterpillar of the *hawthorn butterfly* is frequently very destructive at this season, feeding upon the young leaves as soon as the buds unfold, and stripping the trees so completely as to give them the appearance of winter even in early spring. The hawthorn butterfly very much resembles the cabbage butterfly, but the veins are black and the under side of the wings is white, while the veins of the cabbage butterfly are white and the under side of the wings is of a pale yellow. The hawthorn butterfly's eggs are of a pale yellow, and they are laid on leaves without any covering, but generally in rows close together. The caterpillars, when first hatched, are of a dirty yellow with a black head, and a black ring just below it, and a brownish-red stripe on each side. They are gregarious, and spin a web on the leaf, under which they live until they have destroyed every portion of the cellular tissue, so that the leaves appear quite stripped from all the trees they have attacked. These caterpillars, however, appear only occasionally, and at intervals of sometimes several years in duration; and as birds are very fond of them, great numbers are destroyed by them. The caterpillars of the *gypsy moth* are generally hatched in April. In unfavourable weather they collect upon the trunk of a tree near the fork of the branches, and enclose themselves in a web; but when they feed they disperse themselves all over the tree. They are easily distinguished from other caterpillars by a large yellow-spotted head, and by six pairs of red dots on the hinder part of the back. They have tufts of hair on each side of the body, and single hairs on the back. After moulting, two blue tubercles appear on the fore part of the back, that is, on each of the first four segments of the body, by which they may be identified at once. They are very voracious, and therefore very injurious. When they form their cocoons they are of a reddish colour. The caterpillars of the *yellow-tailed moth* are very troublesome at this time. They are of

a reddish-brown, marked on both sides with white spots. They make themselves a nest by drawing two or three leaves together, and fastening them with a web. They then wander over the tree, devouring the cellular tissue of the leaves, and leaving only the skeletons, returning to their nest whenever the weather is unfavourable. In this month the loose bark should be removed from the apple trees, as it serves as a nidus for the cocoon of the codling moth.

The *red spider* (*Acarus telarius*) is a fearful enemy of plants in gardens. It belongs to the family of mites, and as it has eight legs, it runs with great rapidity. In warm dry summers it is found on plants in the open air. Warmth and dryness seem, indeed, essential to its existence, and one of the best ways of destroying it is to sprinkle the plants it infests with abundance of cold water. Flowers of sulphur too are most valuable in the destruction of this pest; they are simply shaken over the affected parts of the plants with a dredger. This insect generally attacks plants when they are in a weakened state from want of water, or other causes; and when it appears it spins a web over the under surface of the leaves, and sucks out the sap by means of its rostrum. When the young cucumber and melon plants come up, they are often attacked by a little insect called *thrips*, which feeds upon their juices. The larva and pupa of the commonest kind of this insect are of a yellowish-white, but the insect itself is blackish. It attacks the under side of the leaves, and it covers them with a black glutinous substance which stops up the pores of the leaves. The perfect insect resembles a very small fly, not above a line in length, and when any attempt is made to catch it, it springs up, throwing up the lower part of its body at the same time. The best means of getting rid of these insects is to syringe the plants frequently, and to give as much air as the weather will permit. Mr. Ayres, and other gardeners who have written on the subject, all agree that if a moist atmosphere is kept up in the melon and cucumber beds, neither the red spider nor the thrips can exist.

"When the apple tree is in flower," Mr. Westwood observes, "one or more of the buds (see *cc* in fig. 26) in a bunch of blossoms (*A*) may be observed unexpanded, and presenting an appearance quite unlike their beautiful neighbours (*d*). The effect of this is soon perceived in the faded rusty brown colour and withered appearance of the bud; and its cause is the presence, in the interior,

of an insect in different states of maturity. In the bright sunny days of April a small brown beetle (*a* in fig. 26; and *c* in fig. 27, natural size; *c*, magnified), with a moderately long snout, may be seen crawling up the stems of the apple tree, in search of the unexpanded blossom-buds, into each of which the female deposits an

FIG. 26.

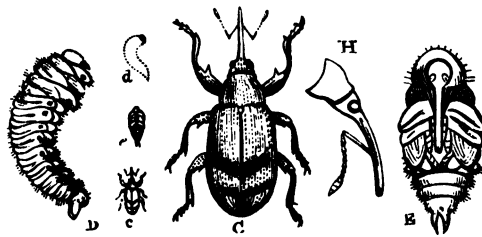


A bunch of Apple Blossoms attacked by the Weevil.

egg, having first bored a hole for its reception in the heart of the bud with her rostrum, at the extremity of which the parts of the mouth are placed." The boring the hole and depositing the egg is said to occupy three quarters of an hour. The female then deposits an egg in another bud, and in this way she continues from eight to twenty days, according to the state of the weather. "The depositon of the eggs," continues Mr. Westwood, "does not

prevent the growth of the bud : but as soon as the egg is hatched the work of destruction begins. The young insect produced from this egg is a little white footless maggot (*b* in fig. 26, a bud cut open to show the larva enclosed), closely resembling in shape the maggot of the nut, only rather more slender towards the extremity of the body. The head is dark-coloured, and horny ; but the rest of the body is fleshy : the three segments following the head being fleshy, and the remainder furnished with a row of fleshy tubercles or warts along the sides of the body. As the creature is in the midst of its food, where in fact there is enough, but not to spare for its consumption, legs would be useless." In fig. 27,

FIG. 27.



The Weevil that attacks the Apple Blossoms, in its various States.

d represents the larva of the natural size ; and *b*, magnified. The grub, as soon as it is hatched, devours first the stamens, and next the style and the incipient fruit, being then full fed. "The injury thus done to the essential parts of the flower," Mr. Westwood continues, "prevents the petals from expanding ; and these remain unconsumed, serving as a sort of dome over the enclosed insect (fig. 26 *b*), which now throws off a thin pellicle, and becomes an inactive pupa, nearly resembling the beetle in shape, but with the wings, legs, and rostrum laid along the breast ; the former not yet having attained their full size. The body is terminated by a rather long forked appendage (fig. 27, *c*, pupa, natural size ; and *e*, magnified). The pupa state is but of short duration, as it requires but four or five weeks from the period of laying the egg for the insect to arrive at perfection. As soon as the latter period is arrived (in the early part of June), the perfectly formed beetle makes

its escape from its cell by gnawing a hole in the side of the withered blossom." The name of this creature, according to entomologists, is *Anthonomus pomorum*; the first name being derived from two Greek words, signifying a feeder upon flowers, in allusion to the habits of the insect. Linnæus considered it to be a kind of Curculio. It is distinguished from the other weevils, which are nearly allied to it, by the position of its antennæ, which are strongly elbowed and inserted in the middle of the snout, as shown at *h* in fig. 27. The beetle is only about one-sixth of an inch in length; it is extremely shy, falling to the ground and counterfeiting death, so that any attempt to capture it in the beetle state is almost impracticable. It is therefore recommended to apply bandages of tar round the stem of the trees early in April, which the beetles, as they always creep up the trees, cannot pass. It is singular that it is only in the hottest weather that they attempt to fly. The buds that have been attacked often fall off the tree in the state shown at *b* in fig. 26.

The *cuckoo-spit*, frog-hopper, or froth-fly (*Tettigonia spumaria*), is generally abundant on the young shoots of various kinds of trees in this month. This very curious insect is nearly allied to the grasshopper, and possesses a most extraordinary property of emitting a kind of frothy secretion somewhat resembling saliva, whence the insect derives its popular English name of cuckoo-spit; indeed, as the insect is generally found about the same time as the cuckoo, it was formerly supposed to have sprung from the saliva of that bird, and we find a Spanish author, who wrote on Natural History little more than a century ago, gravely asserting that to be the fact. Froth-fly evidently alludes to the same secretion; and frog-hopper to the astonishing leaping powers of the insect, which are so great that Kirby and Spence tell us that a frog-hopper will sometimes leap "as much as five or six feet, which is more than 250 times its own length; or as if a man of ordinary stature should be able at once to vault through the air to the distance of a quarter of a mile." This extraordinary locomotive power is brought into action by the great strength of the muscles of the hind legs. The frothy secretion is only produced by the insect when in the larva state, and it is supposed to be intended to preserve its body from the overpowering effects of the sun, as it is secreted most abundantly when the weather is hot. The froth itself appears to be merely water, as after it has remained a short time it drops, like rain, from the

trees where the insect is found abundantly. The larva and pupa resemble the perfect insect in form, excepting that the former is entirely destitute of wings, and that the latter has only rudimentary ones. The perfect insect has, however, both wings and wing-covers, the latter being thicker than the former, and of a somewhat leathery substance. The injury done to plants is by a kind of proboscis, with which the insect wounds the leaves, and sucks out their juices.

Worms are often very troublesome on lawns in this month. The best remedy is to water the lawn with lime-water, made by mixing freshly slacked lime with water in the proportion of forty gallons of water to one peck of lime. The mixture should be well stirred, and then suffered to stand till it is clear before it is used. After the lawn has been watered with it, the worms will rise to the surface and die, and the following day the dead worms should be swept off, and the lawn should be rolled.

M A Y.

General Observations and Directions.

The Weather, &c.—In May the cold of winter has generally given way to a delightful feeling of warmth; and the swelling buds and opening blossoms make it appear in reality, what the poets call it, an emblem of youth, and youthful beauty. The meadows are now covered with daisies and cowslips, and the banks with violets and primroses; the different kinds of crowfoot, or ranunculus, come into flower, and various kinds of insects are to be met with upon the opening buds, so that country walks may be diversified with botanical and entomological studies. It is said that more birds sing in May than in any other month in the year. Sometimes, however, the nights in May are frosty, and even in bright sunshine there are occasionally sharp winds that injure the tender leaves and blossoms of the trees. Some years ago a severe frost in May killed many forest trees, and destroyed the blossoms of nearly all the hardy fruit trees; indeed these last often perish from this cause.

Open Garden.—Numerous species of plants used for summer decoration should now be in process of hardening off, and many of the half-hardy ones, like verbenas, calceolarias, &c., may be planted out. The tenderer kinds had better be kept where they may be protected till the end of the month, or beginning of the next. In places where an abundance of spring flowers are grown, the beds now look prettier and gayer than it is possible to make them during the summer months, and therefore little can be done to the beds except keeping them in a presentable condition. In such cases, the removing of the spring flowers and the planting of the summer ones may be performed on the same day. In the numerous places where the beds are empty all through the spring months, they should now be well forked up and made friable, so

that the putting out of the plants may proceed without delay when the weather is fine enough. Look over herbaceous borders, staking such plants as require it, and clear the spring-blooming plants of their decayed flowers. Now is a good time to increase this class of plants. Primroses, oxlips, polyanthuses, pansies, daisies, and violets, of all kinds, may be parted and planted out in a shaded, moist, rich border. Aubrietias, alyssums, &c., may be struck by cuttings under a hand-glass. Those who wish to have a late bloom of asters and other annuals may sow them now.

In the fruit garden, the careful cultivator should still watch for severe frosts, and protect his trees from their effects; and as a good crop will pay for any amount of attention in this way—and it may be lost by a single night's neglect—it is very expedient to do so. Fruit trees will demand attention in the disbudding, stopping, and regulating of the shoots, and particularly to guard them against the attacks of green-fly and other insects. Where the fruit is abundantly set, it should be partially thinned, reserving the final thinning till the fruit has stoned. Useless shoots should be removed, and those of a gross tendency stopped when young. In disbudding peaches and nectarines, care should be taken not to remove those buds with fruit at their base, but stop them a few joints beyond the fruit. Wherever the blue aphid makes its appearance to an injurious extent on cherries and plums, a decoction of quassia chips should be made, by boiling four ounces of the chips in a gallon of water for ten minutes, and adding four ounces of soft soap, which should be applied with a syringe. The ripening of strawberries in the open air may be well advanced by covering them with lights placed on bricks, or with hand-lights if to spare.

In the kitchen garden, as soon as the crops of brocoli, Savoy sprouts, &c., are removed from the ground, it should be prepared for the reception of other crops, taking care to change the nature of the following crop, and secure rotation as far as circumstances will permit. The ground should be frequently stirred between all growing crops, not only to destroy weeds, but also to benefit the crops. Some loose soil on the surface prevents radiation to a great extent, and is therefore of especial advantage in summer. Radishes, spinach, and such crops that are a little impatient of heat, should now be sown on richly manured borders on the north sides of walls and other half-shady and somewhat cool positions, and where they may be well watered. Of scarlet runners, the main

crop should now be sown, as should occasional sowings of marrow peas, beans, &c. Turnips should be sown on a damp soil, rich and light as possible. Sow a little endive for the first crop, also a little red beet, and some silver-skinned onion (pretty thickly) to produce neat small bulbs for pickling. The thinning of onions, turnips, beet, &c., to proper distances should be looked after. Weeds are now full of vigour, and will soon shoot up to a surprising size if not dealt with in time. Apart from the advantages of cleanliness to the produce, it is always a pleasure to see luxuriant crops of vegetables quite free from weeds.

Indoor Department.—During bright weather plants indoors will be found to pass rapidly out of flower; this it is desirable to prevent to some extent, and it is best done by pretty constant shading, by preserving a low temperature, by moistening the paths and other surfaces, and by not permitting a sweeping draught of air to pass among the plants. These arrangements, while helping to keep the general collection of flowering plants in a fresh state, will also tend to make the conservatory very agreeable to humanity. A parched hothouse is not nice at this season, while one cool, shaded, and damped, and full of fresh flowers tastefully arranged, is as delightful an adjunct to a country seat as has been discovered since the days of the "grand old gardener." But unless a conservatory is filled with a variety of healthy, clean plants, well arranged, with here and there a fern or other verdant plant, it is better to have no conservatory at all, but go out into a wild country lane and find one. In too many conservatories sticks, stakes, and pots are more conspicuous than vegetation. Advantage should be taken of wet days, for growth is so vigorous in houses, frames, and pits just now, and there is so much potting, training, &c., to be done, that a wet day is a decided advantage now and then. Heavy rainy days are the best of all for thinning grapes, and attending to all sorts of indoor plants and fruits, as it is so much pleasanter to work under glass in such weather than when it is warm and sunny: plants may be cleaned from scale and mealy bug, houses may be effectually fumigated, and many other smaller items may be attended to and put in order for the hot weather, when it is not agreeable to visit, and less pleasant to work in hothouses. Even in a garden without glass-houses, a good deal of useful work may be done in the shed on a wet day; stakes, for instance, may be pointed and sorted, and got ready for use, labels also, and where it is desirable to have

plants or trees distinctly and correctly named, a good deal of work suitable for wet days may be found. Sheds too may be cleaned, soil that is stored under cover for potting purposes turned and mixed, pegs may be made for use in the flower garden, crocks broken for drainage, pots cleaned and prepared for potting, old mushroom beds cleaned out, &c., &c.

The houses will now be much relieved by the removal of the bedding plants; give those retained indoors additional room, and pot such as require it. Fuchsias may receive their last shift, achimenes and gloxinias must be potted, and balsams and cockscombs will demand due attention. Hard-wooded plants, such as camellias and azaleas, when making their growth, may be repotted if they require it, and must be assisted with weak liquid manure once or twice a week. Pot heaths, epacris, and other early blooming things that have been cut down and are growing on, and keep them close and shaded until they get hold of the fresh soil; then harden them off and grow them as speedily as possible. Pelargoniums and calceolarias will now be in full beauty; keep them cool, and assist them with weak liquid manure. Cinerarias that have done blooming may be planted out in some light soil, taking care previously that they are clear of insects; then as they break through the soil top-dress them with some light rich soil, and you may obtain any quantity of plants you like. Look to your seedling primulas, and nurse the double varieties carefully in a rather shady, moist situation, until they start into fresh growth. Of course all old flowers must be removed, and young ones also for some time to come. Among fruit, the vines, if not already set, will now be in full bloom; allow a free circulation of air, but at the same time shut up early in the afternoon, with a warm, moist temperature. Directly you see the state of the crop, cut away all superfluous bunches, recollecting that a few good handsome ones are very preferable to a quantity of inferior fruit; indeed, be on the right side, that of under rather than overcropping. The thinning of the grapes cannot be proceeded with too soon. Melons should now be in full vigour, and possibly showing fruit; if so, endeavour to get a full crop by setting the fruit about the same time, as secondary fruit rarely attains much size. Cucumbers will now be in full growth; crop lightly, thin out the fruit, and encourage the plants by a moist atmosphere, and a good supply of water at the root. Successional crops of melons and cucumbers may be prepared.

Tomatoes should be taken from the hot frames in which they have been raised and placed in cold pits or frames to harden off before the planting out time arrives, and finally exposed in the frames night and day (unless the nights prove cold), so that they may endure the change without the slightest check.

If it is desired to propagate the better and rarer varieties of chrysanthemum, cuttings should be put in immediately; they are of all known plants about the easiest to propagate. Perhaps the readiest way is to place a few cuttings of each variety around the edge of a small pot of sandy soil, and put them in a frame till rooted.

Things not to be done in May.

In putting out bedding plants, &c., at this season, never use the common garden trowel, but procure one of the sharp, straight, and rather small mason's trowels, marked with a crown and W. H. This you will find a great improvement on the clumsy concave garden trowel, and you will be able to plant more quickly and better with it.

Never permit crops of seedlings of any kind to be injured before thinning them out. As a rule, crops are not thinned early enough, and become attenuated and weakened from overcrowding before it is thought necessary to thin. When properly thinned, the smallest plants have room to spread forth their leaves.

In planting out the earliest celery, do not trim and mutilate the roots as is frequently done in some parts of these islands, but take up the plants with as good balls as you can get, with roots and leaves intact, and transfer them with as little mutilation as possible to the trenches. When pricked out as they usually are on shallow beds of half-rotten manure, it is very easy to take up the plants with good balls, and almost with the roots intact.

Never put seeds of primroses, polyanthuses, spring flowering alpine, or herbaceous plants, or any like plants which ripen and are gathered at this season, by in a drawer till the spring of the following year, but sow them at once in properly prepared nursery-beds in some spare spot in the kitchen garden. By doing so, nearly a year will be gained, and the seeds that under the common system would be sown in the spring of the ensuing year, will by that time have

become developed into vigorous young plants ready to be planted where they are finally to remain.

Never allow crops of radishes to suffer from drought, or they will be stringy, coarse, and practically worthless.

Never permit the surface of the ground over newly-planted fruit trees to remain bare, but cover it with a couple of inches of half decomposed stable manure, which will prevent evaporation to a large extent, and prove of much benefit to newly-planted subjects.

Never leave the proper loosening up and deep forking of the flower beds till the time of planting out arrives, but have it well done beforehand.

Never permit the awkward handbarrow to be used in conveying plants from the frame-ground or house department to the flower garden. There are some positions in which it is useful for the conveyance of plants where other contrivances cannot be used, but as a rule it is simply effective in wasting human labour.

Never begin bedding by first planting out pelargoniums, heliotropes, and the comparatively tender kinds, but complete the planting out of the hardier kinds, calceolarias and verbenas for example, before touching the others.

Never expose the roots of any plants in process of transplantation an instant more than is necessary. The tender extremities of the young feeding roots soon perish if exposed to sun or a drying air.

In planting small subjects, never press the fingers quite close to the union of the roots with the base of the stem, especially if but little soil is between the fingers and the roots; this practice is not uncommon, and the consequence is that the roots are often broken off near their bases. The right way of inserting a plant is, as a rule, to make a slightly sloping cut with the straight trowel elsewhere recommended, laying the plant against the side of this with its roots properly spread out; then throw the soil freely against it, pressing it sideways, and of course making the surface firm. By this means not a fibre will be broken.

Never tie herbaceous plants to stakes in large bundles like fagots; thin the shoots and tie them loosely so as to appear in their natural position.

Never repot a plant without shaking the soil down and gently pressing it, so as to leave no hollow places between the pot and the

roots of the plant, and, when finished, make the surface quite level and firm.

Never take up tulips, or any other bulbous roots, until their foliage is decaying.

Never bed out half-hardy plants in the flower-garden without thoroughly working to pieces the soil in the beds; this should be done when not wet. Plants put into a hole with a trowel after the beds have been dug over four or five months have little chance of doing well.

Never allow plants under glass to make long weak growths; stop the leading shoots to make them bushy.

Never allow the roots of tender annuals, such as balsams, to get matted in small pots.

Never remove tender plants from their winter quarters to their out-door summer station until the middle of this month, and then place them in a sheltered situation.

Never turn half-hardy plants from a warm greenhouse into the open borders; harden them first in pits or frames, or place them in a warm situation, and shelter them during the night with mats thrown over a few sticks, which may be fastened together so as to form a skeleton frame.

Never put any of the tenderer subtropical plants in the open air till after the end of this month; at present they should be in cool houses or pits, in process of being "hardened off."

Principal Operations in May.

Putting out the Bedding Plants.—In planting bedding plants it is much better to break the ball a little than to put it in whole, and particularly if it be in the condition known as pot-bound, *i.e.*, the roots wrapped round and round the surface of the ball till it becomes a mass of them. Many amateurs, and gardeners too, plant with complete balls; but there cannot be a more disadvantageous condition for the plants. The roots being left in complete possession of the ball, go on feeding on it, while the direct supply of water to the ball ceases, and soon the roots suck it dry. Often a plant perishes from this cause. But by breaking the ball gently we prevent the roots from depending upon it; and then, planted firmly, they grow straight out into the surrounding soils, and become

established at once. In the case of things that have not become pot-bound, but merely exhibit a few young roots round the edges, it is better not to break them, and in this case the earth should be pressed gently but firmly round their sides. All things grown in pans, boxes, shallow pits, or frames, are of course in the best possible condition for planting out the moment they are raised with the trowel. Generally speaking, bedding plants grown in shallow, rough, and very cheap wooden boxes "take to the ground" immediately. It is, in fact, the cheapest and best way of growing them.

Where a large quantity of bedding plants are grown, their conveyance from winter quarters to the flower garden, or wherever they are planted, is often a matter of some importance. The hand-barrow is a barbarous thing to use for this purpose, wasting time as it does, and causing heavy labour. The best thing for the private garden is a spring-barrow, with a wide surface for placing the plants upon, and so poised that when the handles are raised, and the barrow is in motion, it may stand about level.

All bedding plants should be planted before the end of the month if the climate will permit. Of course there are many places where it is desirable not to plant earlier than the first week of June; but in the greater part of the country the end of May is the time. Some little economy and consideration applied to the minor parts of the planting may save much time. All the plants should be placed on the beds they are to occupy first, so that the planter may have nothing to do but put them in as quick as possible. It is better to leave the pegging down and trimming of the beds till all is finished, when it will have a better chance of being done thoroughly. The pots, pans, &c., which contain the bedding plants should be put in some shed till they are well washed, both inside and out, on a wet day when nothing can be done by men or boys out of doors, and then stored for autumn use. It is possible that the planter may have some things which it is desirable to take up in autumn—rare kinds, for example—or perhaps some that he may wish to seed, like *chamæpeuce diacantha*. They should be potted in rather large pots, and these plunged in the ground, say an inch below the rim. Of course some bedding plants taken up in autumn will live through the winter with ordinary care, like a dahlia or a potato; but, on the other hand, some are apt to go off when taken up and potted at that season. When it is a kind that we can

increase sufficiently by cuttings in summer or early autumn, there will be no occasion to lift the old plants; but in the case of not a few new or rare things it is often desirable to save every particle of both root and branch, and such are best secured by being plunged in pots in the ground as we have indicated.

Even as regards the position and soil for each species, a good deal of judgment is required. Things apt to run too much to leaf in our climate will, in all cases, do better planted in light sandy ground—the race of *tropæolums*, for example. On the other hand, subjects that flower freely and well in proportion to their luxuriance of leaf development, like the fuchsia and, generally speaking, the verbena, should have rich light soil. The verbena is particularly fond of fresh soil, the difference between the same kind when growing in old worn-out soil and in that which is fresh being remarkable. All the tenderer subjects, like the coleus, amaranthus, tender annuals, &c., should be kept till the very last. Many parts of the country are too cold for the coleus, which displays such a richly beautiful colour about London. This suggests another hint—i.e., that it is bad and hopeless gardening, attempting to grow things unsuited for our soil and climate. The way to produce the happiest results is by judiciously selecting the things most suited to our various circumstances. But most people disregard this, and merely try to imitate what they see about London or in great places, while they might be developing some noble feature for themselves, and one which might afford a pleasure to many already wearied with the monotony of the flower-garden.

It is well known that calceolarias in beds are not to be relied upon to live the season through. In some seasons we hear few complaints; in others we hear from all quarters that the calceolarias are dying wholesale, and no one can discover the cause. Frequently the plants are destroyed by the sausage-like grub of the “daddy longlegs.” This pest eats away the bark all round at the collar of the plant, and the death of the plant is inevitable; nothing can save it. Before planting it would be well to stir the ground two or three times, to afford the birds a chance of picking out these grubs, which they will do early in the morning when the vermin are moving about. Another good plan to prevent the mischief is to plant lettuces between the calceolarias; the vermin will attack the lettuces first, and by raking the soil round the lettuces many of them may be caught and killed. In dry seasons calceolarias die

when there appears to be no special enemy in the bed. Probably death results in this case from the excessive evaporation of moisture from their leaves, the roots being unable to keep up the supply. Whatever be the explanation when insects are not discoverable, if a very large proportion of rotten hot-bed dung is laid on the bed, and merely "pricked in," as gardeners term it, that is, incorporated only with the top stratum of the soil—say not more than one spade deep—the growth and bloom are superb, and there are no deaths.

The *melon and cucumber beds* must be carefully attended to in this month, and if the heat has decreased fresh linings should be applied, as, if the beds are too cold when the fruit is setting, it will turn yellow and shrivel up. The proper heat is 70° during the night, and from 80° to 85° during sunshine. Fresh air should be admitted in the middle of every day, and water should generally be given about once a week; much, however, depends on the state of the weather. The glasses should be closed as soon as the plants have been watered; but if the watering is performed in the morning the glasses should only be closed for an hour, and shaded, if bright sunshine, and then they may be reopened. Mats should be thrown on at night, and in very hot days it is sometimes advisable to shade the plants from the heat of the sun. If the plants are too near the glass, the frames may be raised by propping them up at the corners with bricks or pieces of wood; but in doing so great care must be taken not to leave any aperture through which cold air may be admitted to the bed. When the melons begin to swell, it is customary to put a piece of tile or slate under them, to preserve them from the moisture of the bed.

Red Beet.—Good and well shaped red beet is always a credit to a kitchen garden, and very welcome indoors. When sown about the middle of May—not later—it often proves better and more suitable for use than if sown in April. When sown early it is apt to get coarse, particularly if the plants are far apart. Sow in drills twelve or fifteen inches apart, in as well prepared, fine, loose, and deep soil as can be found in the garden. The seed should be covered about an inch. If beet is sown in a stiff clay or shallow soil it will never be well shaped, but, on the contrary, forked and ill-flavoured. In thinning beet mind to pull away those that are greenest in the leaves, leaving the best coloured. In raising the plants for use they should be kept whole, for if broken they let out their red juice and are materially injured. No fresh manure should

be used for a crop of beet ; it should be sown in ground that had been well manured for a previous crop. Large roots are not the best, but such as are "clean" and symmetrical. Keep the plants about ten inches asunder in the drills. It is not advisable to leave beet in the ground too long after the first frosts. The last should be taken up in November, not cut too close in or wounded, and then packed between layers of sand, or some such material, in a position in which frost cannot reach them.

Ridge Cucumbers, Vegetable Marrows, Tomatoes, &c.—In the kitchen garden, the cucumbers raised from seed last month should now be planted out on ridges, which may either be raised on the ground or placed in trenches. If trenches are to be made, they should be three feet wide and fifteen inches deep; the earth which is dug out of the trench being laid along the side of it. The trench should be filled with stable manure, prepared as if for a hotbed; and it should be raised eight or ten inches above the surface of the ground. The manure is then to be covered with part of the earth that was taken out of the trench, and the rest laid on the side of the ridge, so as to make the whole into a bed, raised in the centre. Sometimes, to save manure, a series of pits is made, in which the manure is placed instead of being in one continued trench. When the hotbed ridges are made on the level ground, they ought to be full four feet wide. As soon as the ridges are prepared and covered with earth, they should have holes made in them for the reception of the plants, three feet and a half apart, taking care, where pits have been used instead of trenches, to make each hole in the centre of the pit. As soon as the holes are made, a little good rich soil should be put into them, and then they should be covered with hand-glasses, in order that the earth may be warmed by the steam of the manure. In two or three days the earth will be ready for the reception of the plants. One of the hand-glasses being then removed a portion of the earth under it is taken out with a trowel, and in the hollow so made three plants should be put; observing that, if the plants were pricked out into pots in April, the ball of earth should be taken out of the pot and placed in the hollow without breaking it; but if the plants were not pricked previously out they must be separated from each other carefully, keeping to each as much earth as will adhere to it. As soon as they are planted, and the roots covered with earth and made properly firm, they should have a slight watering

from the watering-pot with the rose on. The hand-glasses are then put over the plants, which are to be treated nearly the same as those in frames, giving them abundance of air in the middle of the day and closely covering them with hand-glasses and mats at night. Vegetable marrows, gourds, and pumpkins, may all be planted on ridges, like cucumbers. Capsicums which were raised from seed on a hotbed in March or April should now be planted out in a warm sheltered situation, and in rich ground. They should be put about a foot asunder every way, and slightly watered with a watering-pot having a fine rose. If the weather should be at all cold, they should be covered with hand-glasses at night. It is, however, right to add that these rarely succeed except in very warm parts of the country, and that it is best to grow them in houses or pits. Tomatoes should also be planted out, and they should be placed close to a wall or paling, to which they are to be trained like a wall-tree. They should be allowed plenty of room, and should be placed in tolerably good soil, and in a sunny situation. When first planted they will require shelter for a few nights, and shade during the hottest part of the day. Tomatoes deserve to be more generally grown, especially in the south of England. The chief point in the culture is to keep the plants thinly trained against walls, so that they may have the full benefit of the sun and heat, to pinch them beyond the bunch of fruit, and finally, in early autumn, when as many fruit have set as the heat of our season will ripen, to pinch off all the young fruit and flowers, still thinning the shoots so as to insure the fruit the full benefit of the sun.

Management of Bulbs.—When hyacinths and tulips are past flowering, and the leaves are sufficiently decayed to come off in the hand when slightly pulled, the bulbs should be taken up and spread upon a mat on the floor of an airy room for a fortnight or three weeks, after which the bulbs should be cleaned from any earth that may adhere to them, and the dry fibrous roots rubbed off. As soon as the bulbs are properly dry and hardened, they should be put into bags and boxes and kept there till the season for replanting them returns. All the other kinds of bulbs, particularly crocuses, snowdrops, and all kinds of gladiolus, thrive best when left in the ground entirely to themselves, unless it should be desired to remove any offsets from them. Never take up lilies unless you wish to replant them.

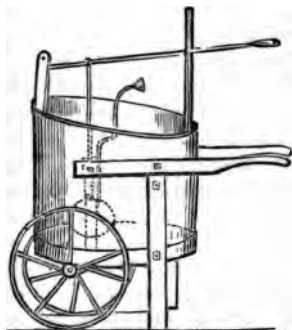
The Gladiolus.—These lovely plants, of which we now possess so

many splendid varieties, are deservedly favourites with amateurs, and deserve to be so to a very much greater extent. About the beginning of May is the best time for the general planting. They may be planted till the early half of June, and this course is desirable where a very late bloom is required. There are two breeds—the varieties of *G. ramosus* which flower in July and August, and the variety of *G. Gandavensis* which forms the most beautiful of flower garden ornaments during the months of August, September, October, and even six weeks or two months longer if planted late in June. The late flowering kinds are by far the best and most important. The plants love a light, rich, and deep sandy soil, and abundance of water when making their growths. When grown for exhibition it is better to place them in beds together, so that all their wants as to soil, water, &c., may be more readily attended to, but the most beautiful result will be attained by dotting them here and there on the flower and rose beds, and in tufts of three or four on the margins of beds and clumps of evergreen shrubs.

Watering.—All newly-planted plants will require occasional watering in dry weather, and the watering-pot should have its rose on. Plants should always be watered with rain or river water, and never with spring or pump water, as it is not only much too cold, but also has some mineral properties which may be injurious to the plants. It is a very wasteful practice to carry water in pots, it should be conveyed in water barrows if it be not laid on and applied with the hose, the best way of all. Mulching the ground over newly-planted trees and shrubs will save a good deal of watering, and indeed prove more effective than the useless dribbling which is generally called watering.

The disbudding of wall-fruit trees should still be continued if necessary; and those shoots which have a fruit at the base should be stopped, leaving only three or four joints. Apricots, peaches, and nectarines should be thinned, so as not to allow more than two of the fruits to remain on the same joint, or only one if the fruits on the tree are very numerous: two fruits on a square foot of wall will be a sufficient number of peaches and nectarines. The coverings that may have been used for protection should now be removed, and if the trees receive a good washing with a garden engine, it will greatly benefit them. Perhaps one of the best machines for this purpose is Read's barrow engine (fig. 28), as it consists of an oval copper vessel, containing twenty-six gallons, fixed on a kind

FIG. 28.

*Read's Barrow Engine.*

of barrow about two feet wide. Pears, plums, and cherries should be looked over at this season, and those shoots which are not required for laying in should have the ends pinched off when they have attained four or five inches' growth. The Morello cherry is, however, an exception, as it does not bear on spurs as the former do, but upon the young wood, the same as the peach.

Plant Houses.—*Greenhouse Plants* may be removed into the open air in this month. The usual rule among gardeners is, that greenhouse plants will stand in the open air when the mulberry

has expanded its leaves. Before the plants are set in the open air, however, they are generally shifted, cut in, and tied to sticks. The pots should be placed on a hard surface, so that the plants cannot push their roots through the hole in the bottom of the pot, and also so that worms cannot enter. Some gardeners strew a quantity of ashes or coal-dust over the ground, on which they place their greenhouse plants, but this has a very ugly appearance. They are best placed on boards or slates, or on a rough trellis work. In the conservatory, where shrubs are planted in the ground, the lights should be taken off, if practicable, so as to give the plants the appearance of growing in the open air. In some places orange trees and myrtles are planted in this manner, so as to give strangers the idea of walking through an orange grove. Those conservatory plants which grow vigorously should now frequently be stopped, that is, they should have the ends of their shoots pinched off to make them become bushy. In the flower-house or pit the temperature at night should be about 65° , as in April, and air should be freely admitted during the day. The plants should be syringed twice a day, and those should be freely watered which are either going into flower or growing rapidly. Greenhouse and hot-house plants should be watered with water which has been placed for an hour or two in the same atmosphere as themselves. Camellias should now be repotted. Tender annuals, such as cockscombs, balsams, egg-plants, globe amaranthus, amaranthus tricolor, and sensitive

plants should be repotted into larger pots as they require it, using a rich soil.

The Vinery.—As vines generally shoot vigorously at this season, they require occasional stopping at the joints, and the shoot need not be stopped at one joint beyond the bunch, as is commonly practised, but is better stopped at three or four joints beyond the bunch. The leading shoot of the vine should, however, be left to grow freely until the berries have swelled to half their full size, and the end of the shoot may be turned downwards, if there is not room to lay it along the top of the house. Immediately after the berries are set, the thinning of them should commence, but this operation requires to be very carefully done, as the bunches should not be touched with the hand. It must be remembered that grapes are produced in bunches or branched racemes, having numerous berries on each branch. To enable the berries to swell to a proper size it is necessary to thin them, and this is done with a pair of sharp-pointed scissors, by cutting out all the smallest and worst-formed berries, and removing most from the interior of the bunch, so as to leave those on the outside, as these will derive most advantage from the sun and air. In order to remove a portion of the berries without touching the bunch with the hand, it is customary for the gardener to use a copper wire, hooked at one end, to hold back each branch of the raceme successively with one hand while he uses the scissors with the other. When

FIG. 29.



A bunch of Grapes with the berries just set.

the upper branches of the bunch are large, and almost as strong as the main stem, it is said to be shouldered, and the shoulders (fig. 29 *a*) should be expanded and supported by strings, or small strands of matting, which should be tied to near the end of the shoulder, and then fastened to the wire trellis, or to the main branch of the vine, so as to make the shoulder form nearly a right angle with the main stem of the bunch. As a rule, amateurs do not sufficiently thin their grapes. They are afraid to remove enough of berries, and the consequence is their grapes are often small and inferior. The house should be kept very moist while the berries are swelling, but the vines should not be syringed. The moist atmosphere is best produced by closing the house at three o'clock, and immediately afterwards pouring a quantity of water on the floor, passages, &c.

The sun will then raise the temperature very high, but not too high for the good of the grapes.

Climbing Plants for Greenhouse, Conservatory, and Stove.—Most people who possess hot and greenhouses are anxious to see them embellished with handsome climbers, and take some pains to establish them therein. They are easily established, but very rarely ornamental. The most ragged, meaningless, and often filthy surface in a garden is that of the wall or pillars in the houses, where wretched climbers are devoured by "scale and bug," and perhaps never yield a flower to compensate for their ugliness. This mostly results from a bad selection of plants. A great number of climbers are to be found in this country; many are glorious things in their native woods, where they have full liberty to run about, but which can never arrive at a free-blooming state in our houses. Others accommodate themselves readily to such places; these we wish to particularize, beginning with the fittest for the conservatory and greenhouse.

The first essential condition which the wise cultivator should require in a climber is that it should be of a cleanly nature—*i.e.*, not palatable to the host of vermin that frequent hot and greenhouses. Therefore we will begin with one which never yet, so far as we have seen, has offered pasturage to any noticeable insect filth—*Plumbago capensis*, an old stove plant, often grown in pots with a poor result, but truly lovely when planted against a pillar, or back wall in a conservatory, or large showhouse of any kind. In pots it is cramped for room, and though beautiful, is not much admired. Planted out in the bed, or border, or floor of a conservatory, it is the sweetest autumn-flowering climber ever seen therein, the flowers being of a beautiful light but decided blue, freely produced in handsome heads. No care whatever is required, except to cut in the shoots close in winter when the leaves decay. When it shoots in spring it may be "left to nature" except so far as training it into the desired position goes when it is a young plant. While adapted for every conservatory in the land, it is particularly so for those places chiefly resorted to by their owners in autumn.

In a warm greenhouse, intermediate house, snug conservatory, or even orchard house in the southern part of the country, we can have nothing more striking and extraordinary than *Tacsonia Van-Volxemi*. The flower is nearly as large as a saucer, shaded or rather varied crimson of a peculiarly beautiful hue, and each is

suspended from a very slender thread-like peduncle nearly or quite ten inches long. It may be easily imagined that such a flower, thus suspended a foot or two over the head in a greenhouse, is a thing of beauty equalled by few objects therein. Plant it in a nice bed of light, free, or sandy loam, and train rather near the glass, causing the specimen to take a direction whence the flowers can suspend their beauty advantageously from a rod, or slender arch crossing a pathway, for instance; or if the conservatory be one of those placed against the house, in a position where they can be seen from the drawing-room or saloon.

The preceding cannot be surpassed, but we must find others for variety sake, and should if the house be large, strongly advise the planting of *Brugmansia suaveolens* against the back wall; it grows without trouble, requiring only simple cutting in or pruning in the winter; it suspends large trumpet-like blooms of the most delicious fragrance in abundance, and its sweetness when fully expanded thus of an autumnal evening, is sure to attract people to the conservatory when it is too dark to be charmed by any beauty of colour therein. There is no finer result produced by any climber than by this in the long narrow house or "conservatory wall." At Chatsworth, when last there, we went out after dark to see it; it is a great source of attraction when in flower to the visitors stopping at the Palace of the Peak. It is as easily grown as a scarlet geranium or a cabbage, only that, of course, it requires greenhouse or conservatory protection, and to be planted out in a bed or border, to assume its vigorous blooming and profusely leafing character. The variegated form of *Cobea scandens* is a handsome plant for conservatory decoration, growing freely, and presenting an attractive appearance when the conservatory is lighted up—a point of some importance for those who occasionally illuminate their conservatories in the evenings.

The fuchsia is perhaps the finest pillar plant in existence, and not half sufficiently used for that purpose. If we plant free-growing kinds of fuchsias in a conservatory bed or against a back wall, they will, if the soil be good and deep, afford a profusion of bloom that will surprise; and as the blooms hang so gracefully, and the plants are but slightly or not at all molested by vermin, they have every good point that a pillar or wall plant should possess, only requiring to be pruned in to within an inch or two of the main stems every winter. The old *Fuchsia globosa* forms an admirable plant in this way, but any free-growing, robust variety will prove equally good.

Of course the plants must not be cut down, but only cut into the stem, which is left at the desired height against the back wall. The fuchsia also makes a capital roof plant, the flowers being particularly attractive when so suspended.

Next to the fuchsia in merit we would place the several kinds of *Habrothamnuses*, particularly *H. elegans*. In consequence of their continuity of bloom we may cut flowers from them nearly all the year round, but they are best fitted for large conservatories, where their vigour of growth may exhaust itself in profuse bloom. In pots and contracted positions they are poor, and continually require heading in. Flowers of all kinds are valuable in winter, particularly if they be sweet, like the large white *Jasminum grandiflorum*, which flowers freely and well in a tolerably warm greenhouse or conservatory, planted out or in pots, though best planted out. Also if a nice little bed of good soil can be afforded to *Rhynchospermum jasmoides*, it will prove an exquisite thing, though it must be planted snugly on a raised central bed, if possible. Generally it is trained on trellises, and in that way makes a very ornamental plant. Of course no well-managed house of climbers can be complete without the magnificent *Lapageria rosea*. Frequently people fail with it; but once well established, it occasions no anxiety. Its requirements are a good, deep, and free soil—sandy peat preferred—abundance of moisture, and protection from slugs. If one of the rising shoots of a healthy young plant be encountered by any of the slug family, he is most likely to use it as we do asparagus—*i.e.*, bite off the succulent green apex, and probably spoil a year's growth. Therefore, watch those strong young and rising suckers, and in buying a specimen to plant, take care that it be a healthy growing one, and not a starved, hidebound, careworn individual, and if you see a strong young sucker arising or half developed, so much the better. One of the finest plants in England of the *Lapageria* is in the Marquis of Westminster's conservatory at Eaton Hall, planted out in a narrow back border, and trained over the roof. It annually has hundreds of flowers expanded at a time, and ripens seed abundantly.

Along with it, and very gorgeous and fine, too, when in flower, is *Cantua dependens*—a plant seen now and then in our gardens, but of which we had no idea of the true value till we saw the specimen planted out here. Against a back wall in a conservatory it will be found to thrive well and without trouble, and of that size which best fits a greenhouse or conservatory. When we say green-

house we of course mean one of some pretensions, in which plants are arranged for show, or in which there is a border of earth, or some position in which climbers may be planted out. *Mandevillea suaveolens* is a pretty white climber, but generally a living mass of aphids, and requiring much trouble to keep it free from that pest. The *Maurandias*, usually included among greenhouse climbers, are too short lived for any important position in glass-houses. The best *Passiflora* is *edulis*, which has large handsome shining leaves, and though the flowers are not handsome it bears fruit abundantly; the fruit is really excellent, unlike a great many "tropical fruits." To these may be added as really good, *Passiflora racemosa-cœrulea* and *Imperatrice Eugénie*, *Kennedya coccinea*, *floribunda*, and *nigricans*, *Convolvulus pannifolius*, *Dolichos lignosus*, *Gompholobium polymorphum*, *Hardenbergia macrophylla*, *Sollya linearis*, *Bignonia alba magna*, and *B. splendida*.

The best stove climbers we can do little more than enumerate. The finest of all is probably the sweet white and free-flowering *Stephanotis floribunda*. It is a noble plant for cutting for wedding or other bouquets, or for any other decorative purpose. It is a favourite hunting-ground of the mealy bug, which usually leaves it as black as soot, and therefore it will require a lot of attention to keep right. The best way is to use the engine freely or the syringe, and thus keep the mealy bug continually under. To succeed thoroughly with this fine plant, it must be planted out in a stove. The best we have ever seen was planted out in a warm early vinery, in a corner of the central bed, partitioned off with a little brick wall, the pit being filled annually with warm leaves, into which the plant rooted after awhile. In marked contrast to the foregoing, but of the greatest value for the beauty of its leaf alone, is *Cissus discolor*, of which little need be said, as it is so often seen at our flower shows in perfect condition. Many fine foliaged plants become green and sickly at the points after attaining a certain age; this, never. It is usually grown in pots, but seen to far greater perfection when trained over head, and the minor branches allowed to hang down, in a fernery or shady moist stove, thus displaying its unrivalled tints, for it is perhaps the most wonderfully marked of foliaged plants as well as the handsomest of stove climbers. In any stove or fernery where a little rockwork is introduced, the highest beauty of which the plant is capable may be attained by planting it in such a position that its shoots may hang down freely over the

face of the rock, but the house must be warm and moist to grow it well thus. Of all stove Passifloras the most useful is *P. princeps*, which, unlike most other species, flowers in racemes, and very continuously. It is a grand subject for cutting for indoor decoration in autumn or winter, and the best flowering thing that can be gracefully grown along the front of a stove. The best way to deal with it is to train it along in wreaths from rafter to rafter in the front of a stove; then the flowers will hang down over the dwarf plants usually placed on the front bench, and produce a charming effect when seen from the end or elsewhere.

With the exception of the *Lapageria*, the *Bougainvillæa* has been more talked of than any other climber of late years, and deservedly so, for its beauty is both great and peculiar. It frequently fails to bloom well. To induce it to do so freely the best way is to plant it out in a snug little bed or pit made under the bench or stand. That pit or bed should be raised above the level floor and filled with good, free, loamy soil, while underneath it should be placed a layer of broken bricks or some rubbish which would act as drainage, and at the same time prevent the roots from getting into the cold and humid soil beneath. The plant should be allowed to make a free growth near the glass, and not be cut back in winter; if cut at all, merely "thinned out." Thus treated, it will furnish wreaths of its sweetly-tinted bracts as much as six feet long. With these we would name as first rate for training up pillars, over slender arches, and overhead in stoves, *Bignonia venusta*, a grand and rich orange flower; *Combretum purpureum*; *Ipomæa Horsfalliæ*, a richly-coloured plant which flowers profusely on the roofs of stoves in winter, and is every way better than most others of the family; *I. Learii* is fine, but a favourite hunting-ground for mealy bug, and quite enough to defile a whole range of glass, therefore it should be omitted; *Ipomæa bona-nox* is particularly valuable in consequence of producing its very large and sweetly-scented blooms after dark. If a single bloom be cut and placed in a glass in the drawing-room about eight o'clock in the evening, a delightful fragrance will be diffused thereby, and the flower will prove of much interest. *Thunbergia Harrisii* will produce its large blue flowers freely if allowed plenty of room, and *Passiflora quadrangularis* flowers and fruits freely if treated to rich soil and plenty of it. The flowers are individually handsomer than those of any other species: to secure the fruit you must fertilize the blooms, and that may be done

effectually by using the pollen of the common *P. cœrulea*. The fruit of this kind has some reputation, but it is rubbish compared to that of the hardier and far easier cultivated *P. edulis*, which we recommend strongly to every owner of a greenhouse or conservatory, as well for its handsome shining green foliage as for its very agreeable fruit.—*Field.*

Gathering and Arranging Flowers.—Now begins the sweet season of bloom, the harvest of the flower gardener, and having flowers to gather, it is important that they be arranged so that their beauty may not be lost or distorted.

The reason that people so often fail in arranging flowers is that they put all the brilliancy together, and perhaps relieve it but slightly, or not at all, with that verdure which abounds everywhere in nature where flowers most charm us. Many persons go into a garden, and, gathering a lot of flowers, stick them closely into a vase of some kind, nearly as close, perhaps, as a broom is tied up. This results from their not seeing the reason why prettily marked flowers please us when set, so to speak, in wide spreads of rich verdure. The result of such a jumble is, that the product is about as attractive to the tasteful eye as a garden all yellow and red; and what should be the sweetest thing in the house is painful to look at compared to a flower and spray depicted on the vase which contains it, or perhaps on the wall of the room. As a rule it may be said that, by using a sufficiency of green, we could get rid of much of this awkwardness, and though it may not enable people to arrange flowers really well, yet a great advance is made when we recognise the value of green. If you see a person who is about to arrange a vase of roses bring in a handful or two of the freshest and finest rose leaves in the garden, you may be pretty sure that the roses will not look amiss when he or she has done with them. When arranging a dish of roses with short stems we always begin by putting a circle of large and fine leaves around the edge, so that their points droop over; and by putting a profusion of them through the blooms, an infinitely better effect may be produced with half, or even quarter the number of blooms, than when they are "lumped in." But it is not enough to avoid what we will call lumping: it is desirable to give each flower its own place, so to speak. This is to some extent a mechanical operation, as in vases generally there is no resisting medium in which to place the flowers. You cannot arrange them rightly without some little contrivance. For a flattish vase

or dish the best thing we know of is silver or any other fine sand, in a very moist, though not actually in a sloppy state. This forms a capital planting medium, so to speak, and at the same time keeps the flowers fresh—at least as much so as water does. By filling the dish or vase with sand, and then when moist rounding it up a little in the middle, you have as good a preparation for the reception of flowers as can be made. Insert the flower stems in it to the required depth, first having pointed them and stripped them of the lower leaves, and as the height of each bloom is of some moment, they may often require to be shortened, which should be done with a sharp knife in a slanting direction, and that will assist them in penetrating the sand with facility. By doing this you have the disposition of your flowers quite under command. If they be of a trailing or decumbent habit, it will be necessary to sink them nearly to the necks; and if they be of an erect or stiffish habit, like geranium or sweet pea blossoms, they may be left as long as may be desired or convenient. Flowers, green leaves, graceful grasses, or any other addenda may be thus placed at discretion. If a coat of the common Lycopodium be placed over the sand, so much the better; it would act as a capital resting-place for the flowers, and do away with the necessity of using a good deal of small stuff to fill up the interstices. Where the receptacle for flowers is very shallow, like the lower tray of some ornaments for table decoration, a little sand is all that is necessary; but it should be borne in mind that such trays are suitable chiefly for flowers that may be cut short, and for little bunches of forget-me-not, Lycopodium, and things which will form erect and somewhat compact little tufts, with short fern-spray, &c. Sometimes rather close little wire coverings are used for dishes and vases, and these certainly support the flowers well and do away with the slightest necessity for crowding, but yet are inferior to the soft moist masses of sand.

By growing the common Lycopodium in dishes till it attained luxuriance, and then bringing them into the house, they would form capital cushions on which to place a few choice flowers.

By filling the dish with very fine sandy peat, passed through a fine sieve, and rounding the centre considerably up, pricking the common Lycopod over the surface, and placing the vases in a warm vinery, fernery, or moist and rather warm structure of any sort, in a month or two they will become masses of green, and droop over the margin of the dish. It may be propagated thus to

any amount, as every bit grows as freely as grass. Half a dozen really good flowers inserted in this—and the pointed stems would pass as readily into it as into the sand—would afford a charming effect; and with a few bits of graceful ferns to counteract the lumpy appearance of the moss, it could not fail to be admired. The Lycopod would look well for a long time, and when it faded or became dusty others could be introduced from the stock so readily propagated. The dishes should have a hole in the bottom for the water to escape into an outer case. Of course this is quite inapplicable to costly, tall, or elegant narrow vases, but it would suit to a nicety low dishes for roses or any other flowers; and such are the most useful for general purposes, as by their judicious use you see the beauty of the flowers, and that alone—which is generally a gain. For the tall vases we have often used sand; but where they are too fragile or expensive to risk breakage by filling them with heavy material, it is better to cut a bunch of some kind of spray—say box, yew, or any small-leaved plant—and trimming it off, put it in the vase so that its top is about level with that of the vase, and on that surface the flowers may be inserted thinly and firmly as may be desired, and the necessity of making a tight bundle of flowers is done away with. Moss is also very useful for various kinds of vases.

Every flower should stand distinct in the arrangement, and it is also very desirable to avoid the crowding in of too many colours into the one vase or dish. A few simple flowers carefully selected from the woods or ditches—say the hawthorn, the forget-me-not, the wild grasses, the meadow sweet, the marsh marigold, &c.—a select few, observe, not too many kinds, and well arranged—will produce a better effect than all the flowers and colours of the garden lumped together. Quiet sweet things like *mignonette*, may be used in abundance as a sort of groundwork for the display of brighter flowers; and why not bunches of it for insertion into the necks of vases as well as the evergreen spray named above? Decided colours should generally be grouped distinct from those of a quiet tone; but so varied are the forms and colours of the flowers of our gardens that it would be folly to be tied by any rule except this: Place the blooms thinly, and in the midst of refreshing verdure, as Nature does; the brighter the colour, the more green should, as a rule, be employed. The procuring, or rather the selecting of this green is an important point. Ferns of many kinds are valuable, but many

other plants are equally so. Of the ferns, the apices of the fronds of the common male fern are highly suited for dressing the margins of large vases, dishes, &c.; while for more delicate work there are innumerable kinds in the way of the maidenhair, and, in fact, every elegant fern may be used. Where there is much decoration of this kind to be done, it is well to grow a few of the most suitable kinds in some quantity for cutting at all seasons. Generally, the spray of the more elegant conifers, such as cupressus nootkænsis and others, the Arbor-vitæ, the neat and pretty new Retinosporas, and, in fact, many things in this way will be found most valuable. They last much longer, are to be had in a fresh and green state at all seasons, and often furnish quite as graceful an effect as the ferns. Some of the better Lycopodiums, too, or Selaginellas, as they are called, are among the very best things that can be used, and in a warm place grow as freely as weeds. Finally, the selecting of the flowers and the cutting of them is worth a thought. The right way to do it is to gather a few suitable kinds in distinct little bundles—whether fern, foliage, or flowers—and then, when placed on a table, the arranger has simply to take the flower or frond he wants—a thing not easy when all are gathered in a promiscuous bundle. Another word, fail not to use the fuchsia and other pendulous flowers for drooping over the margins of all but the lowest dishes, if you want to produce a charming effect.—W. R. in *Field*.

Work for Wet Weather—When in the full zest of early summer outdoor work, the amateur is almost certain to be stopped by a day or two of heavy rain; it may indeed last much longer, and how to utilize the time during the continuance of these rains is of the very highest importance. It is certainly awkward when one is full of zest for gardening to be driven in by those heavy rains, but by a little management plenty of work may be found for wet days, which it is a positive comfort to do on such, and what is more, a positive gain, for who, I should like to know, cares to perch himself up in the roof of a vinery and thin grapes on a hot day, when it may be done so comfortably on a wet one? House work, especially in small places, should be carefully preserved for wet weather, when the conservatory and all the houses may be rearranged and cleaned, and the plants in the other houses sponged and divested of vermin, and beds, &c., in the conservatory thoroughly watered, if it be in the growing season. Then there is the potting and the shed work, particularly the potting off of seedlings, &c., at this

season, and the compost that is stored in sheds to prepare; and there are probably stakes required for the open and indoor gardens; and finally, labels may be prepared and written, shreds cut, and a dozen little operations performed which are as necessary to comfort and convenience in the garden as any work which must be done in the sunshine. And should the garden sheds be as yet but castles in the air, and the spade have to find repose in the back kitchen, what time so good for the amateur to pore over his garden literature as a good heavy, quiet, wet day? And should he even fail with that, he may derive a little philosophy from the following extract from one of the burlesques of Aristophanes, written two thousand three hundred years ago. He is contrasting the comforts of peace with the hardships of war: "I am glad," says the farmer, "to be rid of helmets, and rations of garlic and musty cheese, for I do not love battles; but I do love to sit over the fire, drinking with hearty comrades, and burning the driest of logs, and toasting chick-pease, and setting beech-nuts among the embers, and kissing the Thracian housemaid while my wife is washing herself in the scullery. For when we have got the seed in the ground, and the gods have been pleased to send us a lively rain, nothing is so pleasant as to hear a neighbour say, 'Well, Comarchides, what do you propose to do next? I am for sitting indoors and drinking, while the gods do their duty by the land. So come, wife, roast us three quarts of kidney-beans, and pick out the best of the figs, and let the Syrian wench call in the farm servants, as this is not weather for dressing the vines or grubbing in the mud while the soil is all soaking wet. And let some one fetch me out the thrush and the two finches; and there ought to be a black pudding in the larder, and four pieces of jugged hare (unless indeed the cat has made away with them, for I am sure she was at some mischief last evening); so let the foot-boy bring us three, and give the fourth to his father. And send to ask Æschinades to let us have some myrtle-boughs: and the messenger on his way had best look in upon Charimades, and see if he will come and drink with us, in honour of the rain with which the gods have blessed our crops.' And at the time of the year when the grasshopper is chirping his welcome tune, I dearly love to watch my new Lemnian vines, and notice whether they are as forward as they should be, for I am told they are an early sort. And I like to see the wild figs swelling daily, and the moment it is ripe I put it to my mouth and eat it, and say, 'Bless the dear seasons!' and that is

the way I get plump and sleek in the summer, and not by staring at a great god-forsaken brigadier-general, with three bunches of feathers, and a flaring red cloak, who is always the first to run away when it comes to real fighting."

Garden Enemies.

Quadrupeds.—*Squirrels* are very troublesome in this month in woods and plantations, in picking off the buds of those trees which are late in opening their leaves. The squirrels also do a great deal of mischief in stripping the bark off young trees, particularly the beech and hornbeam; these trees have been watched, and a squirrel has been seen tearing the bark off a fine beech in strips from two to seven inches in length. The fact is, the winter store of nuts, &c., laid up by the squirrel is now exhausted, and the summer fruits are not come in. *Hares* are very troublesome to pinks and carnations in this month, and it is very difficult to prevent their ravages. Some persons advise sowing parsley near the beds, asserting that the hares are so fond of parsley, that when they can get it they will never touch the carnations; but others assert that the smell of the parsley attracts more hares than it can satisfy, and that consequently it is more likely to occasion the destruction of the carnations than to save them. Sticking brimstone matches round a bed of carnations is said to prevent the hares from attacking them.

Birds.—More good is done by birds in this month than injury, as not only the insect-eating birds, but also those which live partly on insects and partly on vegetable substances, destroy immense quantities of insects during this month, not only for their own sustenance, but to feed their young. Some, however, are very destructive in picking the blossoms off the fruit trees; and others labour under the imputation of doing so, without deserving it. One of these I have already alluded to, viz., the common or *blue tit*, and in the month of May this little bird may be seen for hours, with its back downwards, hanging on the branches of fruit trees, but without touching their blossoms, and solely watching for the flies and other insects which constitute its food. This bird is often heard to utter a gruff hurried note, and when it does so, it is a proof that there is a strange cat or dog, or sparrow-hawk, or some other enemy, which has occasioned tom-tit to give the alarm for the benefit of

his numerous family, as these birds generally produce a brood of from ten to fourteen young ones, which, even after they have flown, continue for some time under the protection of their parents. The long-tailed titmouse has the same habits, and its numerous young continue for some months hovering about their parents; constantly flying like darts from tree to tree in quest of food, and chattering to each other all the time in low twittering notes, as though they were making observations on all that passed.

Swallows are very abundant at this season. The common swallow generally appears in England about the 13th of April, but as, when the weather is damp or cold, it has some difficulty to find its food, it is seldom much seen till the month of May, when the fine, dry, warm weather producing abundance of flies, which are its usual food, the swallows are seen darting about apparently in high spirits, particularly at sunset, when the whole fraternity assemble high in the air, and perform numerous graceful evolutions, as if they felt a pride in exercising their powers of wing.

Insects.—Insects are very abundant in the month of May, and one of the most destructive is the *cockchafer*, or Maybug, which devours vegetables not only during the three years that it remains in the larva state, but also when it becomes a perfect insect. It goes through a variety of changes from a very small grub to a very large one, before it forms its chrysalis. The female buries herself about six inches deep in the ground to lay her eggs, which are generally from eighty to ninety in number; they are oval, and of a pale yellow, and they are generally hatched in autumn. The young eat voraciously while they remain in the grub state, which is two or three years, during which period they cast their skins three or four times, going for this purpose deeper into the earth, and burrowing out a hole, where they may effect their change undisturbed, and they do the same in winter, during which they become torpid and do not eat. Before the grub changes into a pupa, in the third autumn after it is hatched, it digs a burrow about a yard deep; and Rennie tells us that "when it is kept in a pot, and prevented from going deep enough into the earth, it shows great uneasiness, and often dies. The perfect beetle comes forth from the pupa in January or February; but it is then as soft as it

FIG. 30.

Grub of the
cockchafer.

was whilst still a grub, and does not acquire its hardness and colour for ten or twelve days, nor does it venture above ground before May in the fourth year from the time of its hatching. At this time the beetles may be observed issuing from their holes in the evening, and dashing themselves about in the air as if blind.

During the three summers of their existence in the grub state, these insects do immense injury, burrowing between the turf and the soil, and devouring the roots of grass and other plants; so that the turf may easily be rolled off, as if cut by a turving spade, while the soil underneath for an inch or more is turned into soft mould like the bed of a garden.

Another most destructive insect in this month is the caterpillar of the *magpie moth* (*Abraxas grossulariata*), as it attacks and devours the leaves of the gooseberry bushes at a time when they are wanted to aid in swelling and nourishing the fruit. The fruit on trees that have been stripped by this insect is generally so much injured as to be of little value; the skin becomes hard and tough, and the gooseberries when eaten are totally without flavour. The caterpillar of this moth is of a yellowish white, with an orange stripe down each side, and numerous large black dots, those on the back being the largest. It is one of the looper or measuring caterpillars, having feet only on the fore and hind parts of its body, so that when it crawls it forms a loop with the central part of its body by drawing up its hind legs to its fore ones. When alarmed, it hastily spins a thread, and lets itself down from the leaf. It is said that no bird will eat these caterpillars; various remedies to prevent their ravages have been recommended, but probably the best is to sprinkle the ground about the roots of the gooseberry bushes thickly with fresh slacked lime in the spring, when the ground is about to be dug, or forked over. If, however, this has been neglected, and the caterpillars have been suffered to appear, the best remedy is picking them off with the hand; or, if this is found to take too much time, the leaves may be dusted with white hellebore powder. This powder, when it is long kept or has become damp, is apt to lose its pungency, and will do no good; but if in the acrid state of fresh-ground powder, which may be known by its effects on the nostrils, it will not fail to kill all the caterpillars it reaches. They are on the under side of the leaf, and the applications tell best when thrown upwards. The chrysalis of the magpie moth is black, with three or four gold-coloured bands at the narrow end, and if all that we see are

destroyed, of course no perfect moths will appear, and no eggs can be laid, to produce caterpillars the following year.

The *ghost-moth* is frequently seen on evenings in May, flitting about and producing a very singular effect, as the under and upper sides of its wings are quite different, and consequently when the moth partially opens and closes its wings, as it does in flying, it seems alternately to appear and disappear.

The *asparagus beetle* (*Lema*, or *Crioceris asparagi*) is very troublesome at this season. In its larva state it is very destructive, as it not only eats through the stems of the young asparagus plants, but it also destroys the leaves and seeds. The perfect insect, which is

FIG. 31.

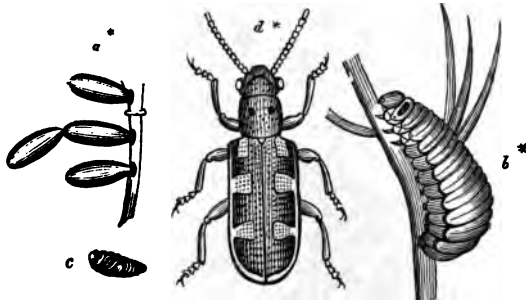


A Branch of *Asparagus* infested with the *Asparagus Beetle* in its different states.

a most beautiful beetle, is only about a quarter of an inch long, but it is most brilliantly marked with red, a rich bluish black, orange, and cream colour. The back and wing-cases are marked with a kind of cross, whence the insect derives its popular French name *porte croix*. It takes its scientific name of *Crioceris*, which is derived from two Greek words signifying rams' horns, from its antennæ being shaped somewhat like the horn of a ram. Fig. 31 represents a branch of asparagus infested with the asparagus beetle in its different states. In this figure, *a a* are the eggs; *b b*, the larvæ; *c c*, the exuviae of the larvæ; *d*, the imago, or perfect in-

sect; and *e* is part of the branch not yet attacked. Fig. 32 shows the eggs, *a*; the larva, *b*; the pupa, *c*; and the perfect insect, *d*; all greatly magnified. It has been observed that these insects prefer beds of seedling asparagus to the old plants; so that, where there are beds of seedlings, they should be carefully examined even if the beds of old plants are found to be free. It is extremely difficult to destroy these insects when the asparagus plants have been suffered to get into leaf, as the beetles, from their very small size, can scarcely be seen among the leaves, and, when they are perceived, they turn to the under side of the stalk, or drop down, feigning death. They should, therefore, be sought for at the time of cutting the asparagus shoots, as they are then more easily discovered. When

FIG. 32.



The Asparagus Beetle in its different states, greatly magnified.

it is found that they have infested a bed, the long stalks of the asparagus, when they are cut down, should be carried away to the reserve ground and burnt, as the female insect lays her eggs upon the branches; and if the asparagus stems, when cut down, were laid upon the bed, as is usually the case, the eggs would remain there till they were hatched in spring.

FIG. 33.



*Hylurgus
piniperdus.*

A beetle, *Hylurgus piniperdus* (fig. 33), does much mischief to the young shoots of the pine and fir tribe in this month, boring into them, as observed by Dr. Lindley, at the base, nearly where the new growth proceeds from the old wood (fig. 34 *a*) and working upwards till it finds its way out nearly at the extremity (*b*). The Scotch

pine is much more frequently attacked by this insect than the spruce fir, and if the trees survive they are seldom worth much as timber: the trees, however, generally die, and as in that state they offer a very favourable nidus for the eggs of the beetle, it is considered advisable to cut down and remove them. This is all that has hitherto been attempted to mitigate or check this spreading evil.

The "worm i' the bud" infests the rose trees in this month. It is the caterpillar of the rose-leaf roller (*Tortrix rosana* Hubner; *Argyrotoxa Bergmanniana* Stephens; *Loxotænia rosana* Linn.), a lovely little moth (*a* in 35), with gold and silver wings, which generally appears on the wing in June and July. The caterpillars of this moth fasten the young leaves of the rose-bush back to back before they are expanded, giving them somewhat the appearance of a folded fan (*d*). The insect then pierces a hole through the leaves to the bud below them, and under this defence it contrives to devour the petals without being seen (*e*). This caterpillar (*b*), when disturbed, quits its retreat, and running backwards very quickly, it spins a thread from its mouth, by which it suspends itself from the leaf. It is of a fleshy substance, and is almost the colour of the petals on which it has been feeding, but it has a black head. When full grown it generally curls up the end of a leaf, fastening it with threads so as to prevent its unfolding, and in this retreat it casts off its caterpillar skin, and becomes a chrysalis (*c*) of a dark reddish, shining brown, only remarkable for having two rows of small hooks towards the lower end of its body, the use of which is to enable the chrysalis to push its way out of the whorl of the leaf, by which means the little moth is at once at liberty, without having to force its delicate little body through the remains of the curled-up leaf, which has probably then become quite dry and shrivelled up. In fig. 36 the moth (*f*), caterpillar (*g*), and chrysalis (*h*) are represented greatly magnified. The best way to prevent the ravages of these insects is to examine the leaves as soon as they unfold, and wherever two are found fastened together, to open them and take out the caterpillar they contain.

FIG. 34.

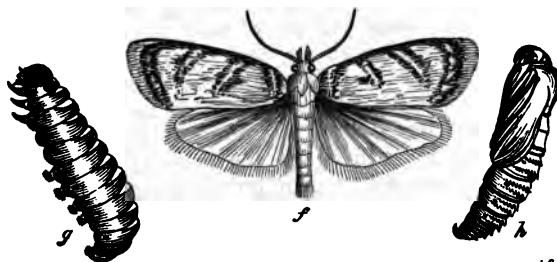


A Branch of a Fir
Tree bored by the
Hylurgus.

FIG. 35.

*A Branch of a Rose infested with the "worm i' the bud."*

FIG. 36.

*The Leaf-roller of the Rose in its different states, greatly magnified.*

It will also be advisable to destroy the moths whenever they are seen. The eggs are of a bright yellow, and are laid in patches, not only on the branches of the rose, but on walls and panes of glass in windows, as the caterpillars when hatched can let themselves down by their threads. I have found them on the window of a bedroom on the second floor; and I have also seen them on the glass of the verandah round our house. They form little oval patches covered with cement of a golden yellow; and each patch contains from fifty to a hundred eggs. Of course, these eggs should be destroyed wherever they are found. It is curious enough that these insects have two natural enemies; the one is an ichneumon, with a black body, red legs and beautiful transparent wings, which lays its eggs either in the body of the caterpillar, or in the chrysalis; and the other is a species of sand-wasp, belonging to the genus *Odynerus*, which, Mr. Westwood tells us, "collects these caterpillars, of which it lays up a store in its cells for its progeny; and I was greatly amused," he continues, "by watching the proceedings of a sand-wasp in attempting to dislodge one of the larvæ from its stronghold in the leaves. After pacing about the tree, and endeavouring, apparently with its antennæ, to discover the retreat of the hidden caterpillar, it paced more demurely about a packet of leaves and introduced its sting into the substance of the leaf; immediately after which it ran to the edge of the whorl, in order to ascertain whether the larva was endeavouring to make its escape from its unknown enemy. It repeated this operation several times; so that I was convinced its object in wounding the leaf was to alarm, or, perhaps, slightly wound the larva, so as to cause it to quit its retreat, when it would have been pounced upon and carried off, to be laid up with others of the same kind of caterpillars, as a store of food for the future progeny of the wasp." A nest of one of these wasps, containing seventeen caterpillars, was shown to me by my kind friend Mr. Waterton, at Walton Hall, in the summer of 1844.

In plant-houses the shoots and leaves of geraniums are often found eaten at this season, though no insect can be discovered on the plants. The mischief is however done by the caterpillar of the *swallow-tailed moth* (*Geometra* or *Ourapteryx sambucaria*), an exceedingly beautiful moth which is frequently seen in gardens; the fore wings are of a pale yellow, and the hind ones are of a squarish shape, terminating at the outer part in a sharp point or tail, which

is marked with two dark spots. The caterpillar fixes itself by its two hind feet to the branch on which it feeds, and it eats rapidly, destroying an immense quantity in a short time. As soon as it has done eating, it drops off the branch, and lies perfectly still on the surface of the earth in the pot, looking so like a piece of dead stick, that the servant of one of our most celebrated entomologists is said to have picked one up to throw it away, and to have been so frightened at its moving and feeling soft, as to have dropped it and run out of the garden in dismay. Sometimes this caterpillar is seen standing out quite stiff from the branch of a tree, and looking so like a piece of dead wood that a gardener has been known to take out his knife to cut it off. The moth flies by twilight, and it looks like a large white butterfly, its pale yellow tint being scarcely seen by the imperfect light. This insect forms a very curious cocoon, which looks almost like a very small bird's nest, and which it hangs from the branch by a number of silky threads. The only remedy is to search for, and destroy the caterpillar, or to catch and destroy the moth whenever it may be seen. The latter is not very difficult, as the moth is somewhat torpid, and flies slowly and heavily.

Snails and *slugs* are very destructive at this season, as the young leaves admirably suit their organs. Neither the snail nor the slug has any teeth, but their mouths are furnished with extremely hard jaws, which easily divide the leaves when they are young and succulent. As snails and slugs can only move when the ground is moist, their ravages are confined to the morning and evening, and as soon as the sun rises, they creep into some shady place, in which they remain quiet during the middle of the day. Persons knowing their habits in this respect find it easy to take them by laying down a few empty flower-pots in different parts of the garden. The snails will creep into these as soon as they have done feeding, and dozens of them may be caught by examining the pots every morning. A few fresh grains laid in various parts of the garden will prove a most attractive bait for slugs; and if the grains are examined every morning, and the slugs found among them are gathered up and destroyed, a garden may soon be nearly cleared of them. Mr. Mechi recommends lime as a cure for slugs, having found it suit well on his farm. His remarks apply with equal force to the garden. "At midnight we sowed lime at the rate of four bushels per acre on the one and a half acre of wheat which

the slugs attacked. The lime was sown against the wind, and the lantern showed that they were out feeding and had been destroyed by the lime. Not a blade has disappeared since. It is clear to me that we have been neglectful in not applying it earlier. As soon as a few plants were missed, the lime should have been sown. We had, however, attributed the loss of plant to the wet weather. It is clear to me that lime should be sown late on a mild night and against the wind, in order effectually to destroy the slug." Probably no other remedy would prove so efficacious for garden crops, but as in Mr. Méchi's case it must be applied at night.

JUNE.

General Observations and Directions.

The Weather, &c.—The month of June is generally one of the most agreeable in the year, in Great Britain. The weather is warm without being oppressively hot; the trees and hedges are clothed in their brightest green; honeysuckles and roses bloom in every hedge; and buttercups, daisies, clover, and poppies bespangle the fields. Indeed, as Sir Walter Scott says;—

“ In jovial June
How sweet the merry linnet’s tune,
How blithe the blackbird’s lay !
The wild buck bells from fenny brake,
The coot dives merry on the lake,
The saddest heart might pleasure take
To see all nature gay.”

Open Garden.—In early localities the flower-garden should be planted by this time, but in many places “ bedding-out ” will yet be the order of the day. However, in all cases where what are called sub-tropical plants are used, it will be well to defer the planting the tenderest of them till the middle of the month, or until there is no danger of their suffering from cold. All watering should be done in the evenings. It is an excellent plan, and one not half sufficiently practised by us, to cover the ground over freshly-planted trees and plants, with a couple of inches of short manure; it prevents evaporation during the dry weather, and does a deal of good. Those that are fond of violets, and have not already divided them, should do so at once. Nice strong suckers taken from the old plants and put in a border of mellow earth to the north of a high wall, or in any other partially shaded position, flower freely and vigorously in winter and spring. This refers to the common sweet violet and its varieties—the Czar and others.

In autumn they should be removed to a sunny and well-sheltered border. Carnations, cloves, and picotees should be propagated at once; either by layers, which is the surest way, or by pipings, which is the simplest and most expeditious. The pipings should be under a handlight, or a spent hotbed if there is one at hand, and shaded during bright weather. Pegging down verbenas and other bedding plants must be attended to. Common hairpins are useful and lasting, and may be bought very cheap by the gross, and pegs may be made from old birch brooms, &c., if a stock has not been prepared in the winter. Take up the bulbs of your favourite tulips at once, putting them in an airy shed to dry previous to storing away till planting time. However, in the case of common bedding and plentiful kinds, it does not matter much whether they are raised or not for two or three years at a time, as they thrive freely where they are but rarely disturbed. Mow frequently, say once in eight or ten days, which will improve the grass in every way, and keep the daisies from exhibiting their pretty flowers. Should you have spreading weeds like the plantain in the grass, the best way is to employ boys or women to cut them off a little below the crown of the root with a strong but sharp knife, disturbing the turf as little as possible. Soon the grass will spread over the spots that were covered by the weeds; and by doing this well, and persevering in it, you will soon have a lawn like velvet.

Strawberries on poor and dry soils will be greatly benefited by good waterings during dry weather when the fruit is swelling. This is the time to secure runners of all the kinds of strawberry that you wish to increase, and also to pot the runners for forcing next season. For all who relish a good forced strawberry, this is an important point, and early strawberries may be enjoyed of flavour and size equal to any out of doors, if we can spare them a shelf or shelves near the glass in an early vinery, or other not over-warm forcing-house, where they may have plenty of air and light, if a special structure has not been made for their accommodation. The thing to do now is to secure the earliest and best runners of the kind it is intended to force, and to peg or lay them in small pots—the size known as 60's—which must be placed on the beds that the runners may root before they are severed from the parent plant; when well rooted in those small pots they should be taken away and repotted into their fruiting pots—generally the size known as 32's—in which they make fine crowns, fit to produce abundance of

fruit when placed under glass next spring. Some fill the fruiting pots at once, and place them in the beds; and this, too, is a good and simple plan. The soil should be rammed firm, leaving, however, space for water to be given. Pots that are filled too full of soil often come to grief for want of water, because the space is so shallow that three or four waterings are required to be poured on before the plant is sufficiently watered. For pots, such as fruiting strawberries are grown in, there should be, after the soil is well rammed down and settled, nearly half an inch of the rim of the pot visible above the compost. But the soil should be very firm, more so than it is easy to make it with the hands, and therefore a wooden stick about a foot long, and with a blunt end, should be used for ramming, if the plants are potted from the small-sized pots into their fruiting ones; but in case of filling the fruiting pots at once, the bottom of a small pot may be used for pressing down the compost. In the stopping, thinning, and training of fruit trees, a great point to bear in mind is that the top of the tree should always be pinched first, be it wall or any other kind. This counteracts the tendency of the sap and vigour of the tree to run to its upper portions.

In the kitchen-garden, celery, endive, cauliflowers, and cabbages, should be transplanted. Keep the crops of carrots and parsnips perfectly clean, and carefully thin them out to proper distances; the same may be said of red beet and onions. Keep the ground continually and well hoed between the crops; this not only saves you perfectly from all annoyance from weeds, but also prevents evaporation, and permits the access of air to the soil, in consequence of the layer of finely pulverized soil on the surface of the well and repeatedly hoed ground. Make another sowing of kidney beans, French beans, scarlet runners, endive, and other things that need not be enumerated. If a regular supply of spinach is desired, it should be sown frequently, and in moist and somewhat shaded spots if possible. Sow also a little of Cattell's Eclipse brocoli, an excellent late sort. Try some of the salad plants in a comparatively shaded position, to prevent them running too soon to seed. In sowing late peas, it is best to depend on the earliest kinds, as they ripen off quickest and best when the days begin to shorten; but Knight's marrow, and Champion of England, though not early peas, are among the best for a late sowing. It is time to put out tomatoes under a warm wall, also gourds, vegetable marrows,

ridge cucumbers, and the like, if not done at the end of last month.

Indoor Department.—Unless the conservatory or blooming-house is well shaded and moistened, and kept cool in hot weather for many weeks to come, there will be little luxury in its possession. Specimens of the hardier kinds of greenhouse plants may be placed out of doors, and when they happen to be of graceful or symmetrical outline, it is good taste to utilize them in the flower-garden or pleasure-ground, either plunged in the earth or sunk in pits on the grass, as they are in the Oxford Botanic Garden and at Battersea Park. It is desirable to hide the pots; in any case precautions should be taken to prevent worms entering the soil and turning it into muck. Seedpods and faded blooms should now be removed from azaleas, and the plants induced to make their growth freely. Plants requiring more pot room should be shifted at once. Young plants of azaleas that it is desirable to make into specimens quickly, may be grown with advantage in a warm close house near the glass; what is called an intermediate house—i.e., between stove and greenhouse—will suit them exactly. The cold frames are now relieved of the bedding plants, &c., and instead of being allowed to remain empty, as they generally are, they should be utilized for the supply of the conservatory in autumn, by growing in them shrubby calceolarias, balsams, &c., and also the younger greenhouse plants, which are very fond of such a position. They may also in some cases be cleared out at once, and planted with melons and cucumbers. Now is the time to encourage free and sturdy growth in all indoor plants by copious waterings both overhead and at root, and by a full supply of air, keeping the growing plants as near the light as possible, to prevent them being drawn. It is a good time to sow a well-selected strain of cineraria seed, and it is pretty well known to growers of this popular flower that kinds as fine as any of the named ones may be raised from a packet of good seed. Late vineries should have a little fire in chilly weather. Late grapes should be watched and thinned before they get too large, as it sadly mutilates the bunch and does little good to the remaining berries to leave that operation till the fruit is nearly or quite half grown. Cucumbers and melons should be frequently gone over and carefully pinched and thinned out to prevent their becoming a confused mass. Keep a sharp look out for red spider, as this minute pest is almost certain to destroy the health and beauty of almost everything

it is allowed to multiply on. Abundant and finely divided syringing from a garden engine is the best cure.

This is a capital time to put in cuttings of any rare or new geraniums, or any other plants which it is desired to increase.

Things not to be done in June.

Never put out tender subtropical plants like Caladiums, &c., in the early part of this month, unless the weather be of settled warm character; where such plants are exposed early in the month, never allow them to perish from very cold winds for want of protection.

Never pursue the old plan of allowing all the shoots of your wall trees to grow vigorously and without check during the summer to be lopped off *en masse* in winter, but pursue the system of summer pinching which is attended with such good results in French and Belgian gardens.

Never pinch back the shoots of wall pear trees, or any other kinds of wall fruit trees, all at the same time; pinch first the shoots of the upper branches, into which the greatest vigour usually flows, and in ten days or so finish the lower parts of the trees. Three pinchings would be better still.

Never pinch back the shoots of pear or other wall trees to three eyes as is very commonly recommended. This close pinching gives the first and strongest shoots of the year a tendency to break again, whereas the object ought to be to induce the lowest eyes on the shoot of the current year to become fruit-buds. As a rule pinch the joint above the sixth leaf; but the rule may be varied according to the strength of the shoot and the object of the cultivator. In pinching espaliers or cordons away from walls, for example, the shoots may be left longer than those of wall trees, which we are naturally desirous to keep as near the wall as possible, so that the fruit may have full benefit of the heat and protection.

Never at this or any other season throw away any bulbous plants that you conceive to be useless. Numbers of persons throw away their bulbs after they have flowered in the beds or the greenhouse, whereas, if properly treated, they would go on blooming beautifully for many years, and even only dotted about the shrubbery borders,

and in spots where they receive no attention whatever, they will prove worthy of preservation.

In placing greenhouse or any other kinds of plants in the open air for the summer, never place them directly on the ground or on gravel, so that worms can enter at the bottom. The best way is to place them on slate or stands of some kind; but when the pots are properly drained there is little danger from this source. A convex crock over the hole, and plenty of finely broken crocks over that, will prevent worms getting in.

Do not forget that this is the month for propagating pinks; among the most charming flowers of our gardens, they deserve the attention of every amateur in the land.

Never nail or tie shoots of any kind very tightly, but leave the shred or matting so loose that the shoot may increase in diameter without suffering a check.

Never after the early part of this month leave window plants in the dry air of a living room that will thrive outside the window. Under good management, much satisfaction may be derived from boxes of bedding plants put outside of windows late in May or early in June, and brought into the house in October.

Never use expensive or troublesome temporary shades for your greenhouse in summer, and do not fear to adopt a permanent shade; that will save you much trouble.

Never pot the free-growing species of *Cereus* and *Epiphyllum* in old mortar rubbish, as is frequently done, but for what purpose I cannot tell, if thriving, good flowering specimens are required.

Never make a practice of watering flower-beds every evening during hot weather; give a good soaking about once a week, and just sprinkle over the leaves every evening.

Never allow plants in pots to root into the soil on which they stand.

Never water plants in flower over their heads.

Never allow the earth of the flower-beds to become crusted over in hot weather, but keep it free by stirring, or much better by covering the surface with some mulching material, such as half-rotten manure—leaf-mould or moss.

Principal Operations in June.

Subtropical plants.—The chief work of the early part of the month in many flower-gardens will be the putting out of the subtropical plants, including among them such handsome succulents as *Echeveria metallica*. Now subtropical gardening is probably beyond the reach of many amateurs, but they are so likely to see beautiful effects wrought by its means that a short account of what it is cannot fail to be useful to some. The following account is from the *Parks, Promenades, and Gardens of Paris* :—

“The term subtropical is popularly given to flower-gardens embellished by plants having large and handsome leaves, noble habit, or graceful outlines. It simply means the introduction of a rich and varied vegetation, chiefly distinguished by beauty of form, to the ordinarily flat and monotonous surface of the garden. The system had its origin in Paris, where it was first carried out on a small scale around the old Tour St. Jacques, and is now adopted to a greater extent there than anywhere else. Indeed, the presence of great numbers of fine-leaved plants is one of the most marked features in the parks and public gardens of that city. Mr. Gibson, the able and energetic superintendent of Battersea Park, undaunted by the popular nonsense about the great superiority of the climate of Paris over that of London, boldly tried the system, and with what a result all know who have seen his charming ‘subtropical garden’ in Battersea Park.

“This system has taught us the value of grace and verdure amid masses of low, brilliant, and unrelieved flowers, or rather has reminded us of how far we have diverged from Nature’s ways of displaying the beauty of vegetation. Previous to the inauguration of this movement in England, our love for rude colour had led us to ignore the exquisite and inexhaustible way in which plants are naturally arranged—fern, flower, grass, shrub, and tree, sheltering, supporting, and relieving each other. We cannot attempt to reproduce this literally, nor would it be wise or convenient to do so; but assuredly herein will be found the source of true beauty in the plant world, and the more the ornamental gardener keeps the fact before his eyes, the nearer truth and success will be attained. Nature *in puris naturalibus* we cannot have in our gardens, but

Nature's laws should not be violated, and few human beings have contravened them more than our flower-gardeners during the past twenty years. We must compose from Nature, as the best landscape artists do, not imitate her basely. We may have all the shade, the relief, the grace, and the beauty, and nearly all the irregularity of Nature seen in every blade of grass, in every seawave, and in every human countenance, and which may be found too, in some way, in every garden that affords us lasting pleasure either from its contents or design. Subtropical gardening has taught us that one of the greatest mistakes ever made in the flower garden was the adoption of a few varieties of plants for culture on a vast scale, to the exclusion of interest and variety, and too often beauty or taste. We have seen how well the pointed, tapering leaves of the Cannas carry the eye upwards; how refreshing it is to cool the eyes in the deep green of those thoroughly tropical Castor-oil plants with their gigantic leaves; how grand the Wigandia, with its wrought-iron texture and massive outline, looks after we have surveyed brilliant hues and richly-painted leaves; how greatly the sweeping palm-leaves beautify the British flower garden;—and, in a word, the system has shown us the difference between gardening that interests and delights all the public, as well as the mere horticulturist, and that which is too often offensive to the eye of taste, and pernicious to every true interest of what Bacon calls the 'Purest of Humane pleasures.'

"But are we to adopt this system in its purity? Certainly not. All practical men see that to accommodate it to private gardens an expense and a revolution of appliances would be necessary, which are in nearly all cases quite impossible, and if possible, hardly desirable. We can, however, introduce to our gardens most of its better features; we can vary their contents, and render them more interesting by a cheaper and a nobler system. The use of all plants without any particular and striking habit or foliage, or other distinct peculiarity, merely because they are 'subtropical,' should be tabooed at once, as tending to make much work, and to return—a lot of weeds; for 'weediness' is all that I can write of many Solanums and stove plants of no real merit which have been employed under this name. Selection of the most beautiful and useful from the great mass of plants known to science is one of the most important of the horticulturist's duties, and in no branch must he exercise it more thoroughly than in this. Some plants

used in it are indispensable—the different kinds of *Ricinus*, *Cannas* in great variety, *Polymnia*, *Colocasia*, *Uhdea*, *Wigandia*, *Ferdinanda*, *Palms*, *Yuccas*, *Dracænas*, and fine-leaved plants of coriaceous texture generally. A few specimens of these may be accommodated in many large gardens; they will embellish the houses in winter, and, transferred to the open garden in summer, will lend interest to it when we are tired of the houses. Some *Palms*, like *Seaforthia*, may be used with the best effect for the winter decoration of the conservatory, and be placed out with an equal result, and without danger in summer. The many fine kinds of *Dracænas*, *Yuccas*, *Agaves*, &c., which have been seen to some perfection at our shows of late, are eminently adapted for standing out in summer, and are in fact benefited by it. Among the noblest ornaments of a good conservatory are the *Norfolk Island* and other tender *Araucarias*—these may be placed out for the summer much to their advantage, because the rains will thoroughly clean and freshen them for winter storing. So with some *Cycads* and other plants of distinct habit—the very things best fitted to add to the attractions of the flower garden. Thus we may enjoy all the benefits of what is called subtropical gardening without creating any special arrangements for them in all but the smallest gardens.

“But what of those who have no conservatory, no hothouses, no means for preserving large tender plants in winter? They too may enjoy in effect the beauty which may have charmed them in a subtropical garden. I have no doubt whatever that in many places as good an effect as any yet seen in an English garden from tender plants, may be obtained by planting hardy ones only! There is the *Pampas Grass*—which when well grown is unsurpassed by anything that requires protection. Let us in planting it take the trouble to plant and place it very well—and we can afford to do that, since one good planting is all that it requires of us, while tender things of one-tenth the value may demand daily attention. There are the hardy *Yuccas*, noble and graceful in outline, and thoroughly hardy, and which, if planted well, are not to be surpassed, if equalled, by anything of like habit we can preserve indoors. There are the *Arundos*, *conspicua* and *Donax*, things that well repay for liberal planting; and there are fine hardy herbaceous plants like *Crambe cordifolia*, *Rheum Emodi*, *Ferulas*, and various fine umbelliferous plants that will furnish effects equal to those we

can produce by using the tenderest. The *Acanthuses* too, when well grown, are very suitable to this style; one called *latifolius*, which is beginning to get known, being of a peculiarly firm, polished, and noble leafage. Then we have a hardy Palm—very much hardier too than it is supposed to be, because it has preserved its health and greenness in sheltered positions, where its leaves could not be torn to shreds by storms through all our recent hard winters, including that of 1860.

“And when we have obtained these we may associate them with not a few things of much beauty among trees and shrubs—with elegant tapering young pines, many of which, like *Cupressus nutkaensis*, have branchlets finely chiselled as a *Selaginella*; not of necessity bringing the larger things into close or awkward association with the humbler and dwarfer flowers, but sufficiently so to carry the eye from the minute and pretty to the higher and more dignified forms of vegetation. By a judicious selection from the vast mass of hardy plants now obtainable in this country, and by associating with them where it is convenient, house plants that are stood out for the summer, we may arrange and enjoy charms in the flower garden to which we are as yet strangers, simply because we have not sufficiently selected from and utilized the vast amount of vegetable beauty at our disposal.

“Let us next select the finer tender plants for this purpose, speak of the treatment they require, and the uses or associations for which they are best adapted. In selecting tender plants of noble aspect or elegant foliage, suited for placing in the open air in British gardens during the summer months, we shall confine ourselves to first-class plants only. It is necessary that they be such as will afford a distinct and desirable effect if they *do* grow; and that is by no means to be obtained from many subjects recommended for subtropical gardening. And above all we must choose such as will make a healthy growth in sheltered places in the warmer parts of England and Ireland at all events. There is some reason to believe that not a few of the best will be found to flourish much further north than is generally supposed. In all parts the kinds with permanent foliage, such as the New Zealand flax and the hardier *Dracænas*, will be found as effective as around Paris, and to such the northern gardener should turn his attention as much as possible. Even if it were possible to cultivate the softer-growing kinds like the *Ferdinandas* to the same perfection in all

parts as in the south of England, it would by no means be everywhere desirable, and especially where means are scarce, as these kinds are not capable of being used indoors in winter. The many fine permanent leaved subjects that stand out in summer without

FIG. 37.

*Variegated Agave.*

the least injury, and may be transferred to the conservatory in autumn, there to produce as fine an effect all through the cold months as they do in the flower garden in summer, are the best for those with limited means."

A Select List of Subtropical Plants suited for use in our Climate.

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| 1. <i>Acacia lophantha.</i> | 19. <i>Chamaerops humilis.</i> | 38. <i>Phoenix dactylifera.</i> |
| 2. <i>Agave americana.</i> | 20. " <i>excelsa.</i> | 39. " <i>sylvestris.</i> |
| 3. " " <i>va-</i> | 21. " <i>Palmetto.</i> | 40. <i>Phormium tenax.</i> |
| <i>riegata.</i> | 22. <i>Cordyline indivisa.</i> | 41. <i>Polymnia grandis.</i> |
| 4. <i>Alsophila australis.</i> | 23. <i>Corypha australis.</i> | 42. " <i>pyramidalis.</i> |
| 5. " <i>excelsa.</i> | 24. <i>Cyathea dealbata.</i> | 43. <i>Ricinus communis,</i> |
| 6. <i>Aralia macrophylla.</i> | 25. <i>Cycas revoluta.</i> | <i>in many varieties.</i> |
| 7. " <i>papyrifera.</i> | 26. <i>Dicksonia antarctica.</i> | 44. <i>Seaforthia elegans.</i> |
| 8. <i>Araucaria excelsa.</i> | 27. <i>Dracæna australis.</i> | 45. <i>Selinum decipiens.</i> |
| 9. <i>Caladium esculen-</i> | 28. " <i>Draco.</i> | 46. <i>Solanum macrophyl-</i> |
| <i>tum.</i> | 29. <i>Echeveria metallica.</i> | <i>lum.</i> |
| 10. " <i>bataviense.</i> | 30. <i>Erythrina crista-galli,</i> | 47. " <i>marginatum.</i> |
| 11. <i>Canna robusta.</i> | <i>and its varieties.</i> | 48. " <i>Warscewiczii.</i> |
| 12. " <i>nigricans.</i> | 31. <i>Ferdinanda eminens.</i> | 49. <i>Tupidanthus calyp-</i> |
| 13. " <i>discolor flori-</i> | 32. <i>Ficus elastica.</i> | <i>tratus.</i> |
| <i>bunda.</i> | 33. <i>Melianthus major.</i> | 50. <i>Uhdea bipinnatifida.</i> |
| 14. " <i>metallica.</i> | 34. <i>Monstera deliciosa.</i> | 51. <i>Verbescina gigantea.</i> |
| 15. <i>Carludovica palmata.</i> | 35. <i>Musa Ensete.</i> | 52. " <i>verbasci-</i> |
| 16. <i>Caryota urens.</i> | 36. <i>Neottopteris austra-</i> | <i>folia.</i> |
| 17. " <i>sobolifera.</i> | <i>lasica.</i> | 53. <i>Wigandia macro-</i> |
| 18. <i>Chamaepeuce dia-</i> | 37. <i>Papyrus antiquorum.</i> | <i>phylla.</i> |
| <i>cantha.</i> | | |

Subtropical plants that may be raised from seed.—The best and readiest way to get up a stock of these plants is by raising them from seeds. Annuals, like the Castor-oil plant, must of course be raised from seeds in any case; but a number of the very finest perennial kinds may also be raised thus with great facility and pleasure to the raiser, in time quick enough to satisfy ordinary patience. And of those which cannot soon be grown to a presentable size from seeds, like Palms, Dracænas, &c., it is yet very desirable to raise a batch, inasmuch as permanent dignified subjects like these are always of a greater value in any stage of their existence than the perishable rapid-growing subjects so usual with us. All the following have been offered in recent seed catalogues:—

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|-----------------------|----------------------------|-------------------------|
| Abutilon, in variety. | Canna, in profuse variety. | Cordyline nutans vera. |
| Acacia lophantha. | Chamaepeuce Cassabonæ. | " <i>superbicus.</i> |
| Aralia papyrifera. | " <i>diacantha.</i> | " <i>Veitchii.</i> |
| " <i>Sieboldi.</i> | Chamaerops humilis. | Corypha australis. |
| Areca sapida. | " <i>glauca.</i> | Erythrina crista-galli. |
| Artemisia argentea. | " <i>macrocarpa.</i> | Ferdinanda eminens. |
| Bambusa himalaica. | Cordyline indivisa vera. | Latania borbonica. |

Melianthus major.	Polymnia grandis.	Uhdea bipinnatifida.
Musa Ensete.	Ricinus, in variety.	Verbesina verbascifolia.
Nicotiana grandiflora, a	Seaforthia elegans.	Wigandia macrophylla.
variety of N. tabacum.	Solanum macrophyllum.	" " Vigieri.
Nicotiana wigandioides.	" marginatum.	Zea japonica variegata,
Phormium tenax.	" robustum.	and others.

As to the time of sowing these seeds—except they come to hand in mid-winter or late autumn—they should be sown as obtained, as it is very unwise to keep them lying in a drawer till some supposed "right time" again comes round. If obtained in late autumn or in winter, sow in heat in very early spring. The Castor-oil plant and Annuals need not be sown till March.

The Kitchen Garden.—Melon beds will require attending to at this season, as, when the sun is very hot, it is apt to scorch the leaves and check the growth of the fruit. There should, therefore, be a slight shade thrown over the glass from eleven o'clock in the morning till two or three. The beds should be occasionally watered. The cucumbers in frames in this month will require to have their shoots thinned and regulated occasionally. The young shoots must always be stopped at the joint where the fruit appears: air must be given regularly every day, and water two or three times a week. The cucumbers under hand-glasses will now be growing vigorously, the glasses should be raised on props, so as to suffer the runners of the cucumbers to spread under them. The cucumber plants for pickling cucumbers that were sown in the open garden should be thinned out as soon as they show the first rough leaves.

Many kinds of culinary vegetables should be transplanted in this month, among which may be mentioned endive, lettuces, cauliflowers, brocoli, borecole, savoys, cabbages, and leeks. The savoys and cabbages which are planted out this month are for the principal winter crops, and they should be placed in rows two feet and a half asunder, and two feet apart in the row. Red cabbages, which were sown in the spring, may also be planted out at this time. In gardens where there is but little room, cabbage-plants are frequently put between rows of beans and peas, as the cabbages will be a long time before they are ready, and the beans and peas will soon be cleared off the ground. The leeks should be planted about eight or nine inches asunder, and about six inches apart from each other in the row. Leeks are considered best when they are

transplanted in the following manner: holes are made with the dibber, six inches deep, and in the bottom of each hole a leek is placed, after dipping its fibrous roots in mud and water, but without closing the earth round the neck of the plant, as was before recommended for large onions.

Celery is generally planted out in trenches in this month for an early crop; the situation chosen for the trenches should be open, and the soil rich and deep, but rather light. The trenches should be made ten inches or a foot wide, three or four feet apart, centre from centre, and eight or ten inches deep; the soil dug out being formed into ridges between the trenches, which should be in the direction of north and south. As every trench is opened, a coating, five or six inches in thickness, of thoroughly rotted manure should be dug into the bottom, and along the centre of the trench the plants should be inserted with a trowel, at six inches apart. When the plants are being removed, previously to planting, all the side slips should be carefully taken off, but the tops should not be shortened.

Potatoes should be earthed up again in this month; and if any flowers appear on the plants, most gardeners remove them, as potatoes are scarcely ever grown from seed; and if the seed is not wanted, it is better to prevent the plant from forming it, as it is natural to suppose that the nourishment which will pass into the seed will, if no seed is formed, be expended in the tuber. Some gardeners cut off the tops of the haulms (as the stem and leaves of the potato plant are called), from the same wish of giving strength to the tuber: but this seems to be an erroneous idea, as the leaves are required to elaborate the sap; and unless they are not only abundant, but fully exposed to the light and air, the potatoes will be deficient in feculent matter; or, in other words, will not be mealy. Taking off the flowers so as to prevent the formation of seed, on the contrary, can do no harm to the plant.

Thinning, pruning, and training Wall-fruit trees.—Wall-fruit should now be carefully thinned, if this business was not thoroughly done before. The wall-trees should be trained; and, if the dis-budding has been neglected, they will require summer-pruning. In pruning and training trees, regard should be had to their manner of bearing; and all those kinds that bear their fruit on the young wood of the previous season, such as the apricot, the peach, the nectarine, and the Morello cherry, should have their branches trained close to

the wall; while all those that bear their fruit on projecting spurs, such as the pear, the plum, and the common cherry, should have their projecting shoots left. Some gardeners put nets over the cherry-trees in this month, to protect the fruit from the birds. Vines against walls must now be summer-pruned, by stopping the young shoots a few joints above the fruit. The stopping of the shoots of pear and other trees will now demand much attention, and a great deal depends on how it is done.

If allowed to grow away unchecked, they exhaust the tree, and prevent the light from getting at the parts close to the wall—those which we must reserve for the all-important work of bearing the fruit. If we allow fruit-trees to burst away from the wall on which they are planted, clearly they get no advantage from being placed against it; if pinched in too closely and repeatedly, the sap is too much repressed, young branches break from the eyes that otherwise would have formed fruit buds, and much mischief is done. As a rule no pinching of the side shoots should be permitted till the shoots have made six good leaves, when they may be pinched immediately above the sixth leaf. But generally speaking people leave their trees till they have made more than six leaves, and then the best plan is to stop them generally to a length of about six inches. This will not start the buds at the base of the shoot (the ones we want to form fruit buds) into shoots. After the pinching or stopping, most probably the shoots will break again from near the apex; and about this stopping we need not be so particular. These secondary growths may be pinched at one, two, or three inches, as convenience directs. They have to perform no important part in the future existence of the tree, as the lower down on the first shoots we get the fruit buds the better, and the shoot will be pruned back to these buds in winter. These directions apply to espalier trees as well as to those on walls. It is most important to perform the pinching at intervals, and to begin at the top branches. By pinching back the shoots of the top pair of branches to-day, the pair beneath them four or five days later, and so on to the bottom of the tree, we force the sap to flow more to the lower parts of the tree—an advantage, inasmuch as it is the natural tendency of the sap to mount to the higher parts, to the weakening of the lower branches. It is also a good plan to pinch the shoots of the higher branches an inch or two shorter than the lower ones; and the strongest part of the tree should always be pinched more than the

weaker. The same directions apply to other fruit trees as well as to the pear; cherries and plums will bear pinching back a little shorter than either pears or apples.

Keeping bulbs.—The tulip and hyacinth bulbs that were taken up last month will now be dry enough to put into bags and boxes, or upon shelves; and those which were not ready to take up in May may now be removed. Jonquils, and the various kinds of polyanthus narcissus, are frequently taken up in this month, as some gardeners fancy they degenerate if left in the ground. Most of the other kinds of bulbs, particularly the crocuses, the Guernsey lily, and the different kinds of gladiolus, ought not, however, to be disturbed, unless it is to take off the offsets, and even then the old bulbs should not be taken up, as, if they are, it will be found that the plants will not flower so well the following year. As, however, mice are very fond of the corms, or solid bulbs, as they were formerly called, great care should be taken to preserve them. Ranunculus and anemone tubers may be taken up as soon as the leaves decay.

Carnations are now near flowering, and as it is considered a great beauty in this flower to have it open regularly, gardeners frequently slit the calyx in all the places where the sepals are joined together, to assist the flower in spreading regularly round; while to prevent the calyx from opening too far, a piece of wax thread is tied round the middle, so that the sepals cannot open above half their length. Another means of effecting this is by what is called carding: a piece of card-board is cut out, the size the flower is expected to be when expanded, and a hole is made in the middle of it, just large enough to admit the flower-bud before its expansion. The card-board is then pushed over the bud about half-way down the calyx, so that when the flower expands, its petals appear to rest upon the cardboard.

Box-edgings should be cut about the middle of this month if the weather be moist, but if the weather should chance to be dry it is better to wait a fortnight, or even three weeks for rain; as the edgings, if cut in hot dry weather, are apt to become brown and unsightly. Box-edgings frequently become thin at the bottom if they are suffered to grow too high. The usual rule is, never to let them be above three inches high, and two broad.

Plant-houses, &c.—As the greenhouse plants are generally standing in the open ground in this month, they require very little care

except removing dead leaves, moving the plants to prevent their rooting through the pots, and occasionally loosening the surface or the soil in the pots, and careful and thorough watering in hot weather. If any of the plants appear to droop, when they evidently do not want water, they should be turned out of the pot upon the hand, as directed for repotting, as most probably there is a worm in the pot. It is the nature of earth-worms to make their way through the ground in search of food, and when one happens to be in a pot, from being in so confined a space, it goes backwards and forwards, while the earth in the pot being quite full of roots, the worm tears them asunder every time it passes through the soil; and, in time, it kills the plant, by depriving it of the spongioles of its roots, which are generally near the bottom of the pot, and without the aid of which the plant cannot obtain nourishment from the soil.

In those places where the conservatory is so arranged as to be wholly or partially removed in summer, it is at this season that the glasses, or glasses and framework, should be removed. Where a number of plants, such as araucarias, camellias, and orange trees are planted in a conservatory, the effect produced by the removal of the framework is exceedingly good. When the framework, or only the glasses, have been removed, no particular care is required in the management of the plants; but where the glasses are not removed, the plants will require frequent watering and syringing. The ground should also be gently forked over occasionally, and the leaves of the camellias, and other broad-leaved plants, should be sponged to keep them clean and their pores open, and also to prevent the attacks of the black aphid, which is very frequently found on camellia leaves at this season.

In the vinery the grapes should be closely examined, and if it appear that there are still too many berries to allow them to swell properly without becoming wedged tightly together, a few more should be cut out. Atmospheric moisture must be dispensed with as soon as the berries begin to change colour, and abundance of air must be given at all times.

Erection of Garden Structures.—June is the best month in the year for building, because the weather is generally fine, the days are long, and, consequently, the work can be performed rapidly; and because there is no danger of frost occurring before the mortar has had time to set. June is also comparatively a leisure month for the gardener, as there are few operations of importance which it is ne-

cessary to perform in this month. The buildings which are required for gardens, are either walls or plant-houses: of walls there are two kinds, plain and flued; and of plant-houses there are many varieties, but four or five will be sufficient for the present work, as one or two houses are generally considered sufficient for an amateur's garden. I shall, therefore, only describe a greenhouse, a conservatory, a vinery, and a flower-house or pit, with a cold-pit for preserving plants during winter, and a pit for growing cucumbers and melons.

Building Walls.—Walls in gardens are not used merely as boundary fences, but for the purpose of training trees against them, and thereby accelerating the ripening of the fruit, as walls are said to increase the temperature of the air immediately in contact with them as much as 7° of south latitude. This is partly because they shelter the trees trained against them from cold winds, and partly because they serve as reservoirs of heat, absorbing heat from the sun during the day, and giving it out by radiation at night, and thus maintaining a warm atmosphere round the plants, while the atmospheric air is cold. They also prevent the loss of heat which the plants would themselves sustain from radiation if they were fully exposed to the air.

Plain Walls.—Garden walls are formed of different materials, according to circumstances. Where bricks are scarce and dear and stone is plentiful, walls may be built of stone and faced with brick, which will be as good as a solid brick wall. If a wall is to be built of stone only, the stones which are used should be squared, and rendered as nearly of the same size as possible. Walls are sometimes built of mud, but they are not to be recommended: cob walls, which are formed of a mixture of mud and straw, are, however, common in some of the old gardens in Devonshire, and I have seen very fine fruit growing against them. There is no reason why cob walls, or walls of some kind of cheap concrete should not be substituted for the expensive brick walls now thought so indispensable. The walls can always be covered with wire work, so that training is quite as facile as against a brick wall, indeed more so. Slender galvanized wire, the sizes known as Nos. 12, 13, or 14 is the only material that should be used for wiring garden walls. Walls are best ten or twelve feet high, and fourteen inches thick. Where piers are used, the thickness of the walls may be diminished one fourth; but it must not be forgotten that piers are great impediments.

ments to good training. Building the walls hollow is also recommended from motives of economy; but, should the wet lodge in the hollow space between the walls, the walls frequently will give way. When walls are built hollow, the sides are four inches thick, and they are joined together at intervals of three or four feet by cross partitions of four-inch brickwork.

Coping.—In building a garden wall, intended for the choicer kind of wall-fruit trees, it is always desirable to insert strong iron brackets, projecting at least twenty inches, at intervals of six or eight feet along the upper part, in order that they may support a portable deep wooden coping, like that before described. All garden walls should be furnished with a stone coping; it should be about four to six inches deep, to prevent the wet lodging on the brickwork; but they should also have a moveable wooden coping, to guard the early blossoming fruit trees from the effects of frosts. The importance of this has been elsewhere alluded to. The foundations of garden walls should be at least as deep as the ground is originally dug or trenched.

Building Plant Houses.—It is a curious fact, that in laying out grounds and designing villas, the situation of plant-houses, except those in the kitchen-garden, is very seldom properly attended to. When an architect is required to add a conservatory to a villa, his principal object is to place it so as to harmonize with the architecture of the house, without the slightest regard to the plants which are to be grown in it. Even landscape gardeners think only of putting such plant-houses as are not ornamental in such situations where they will not be seen; forgetting that such places are almost always either shaded by trees, or secluded in some other manner from the sun and air, a free access to both of which is essential to the health and vigour of the plants. It is true that many able writers on gardening say that the difficulties occasioned to the cultivator by the unsuitable situation of plant-houses may be overcome by skilful management; but it is certainly best for an amateur to have as few difficulties to contend with as possible, as the object of an amateur is not so much to show skill in gardening as to have fine plants. Whenever, therefore, an amateur has an opportunity of erecting plant-houses, a good situation ought to be one of the principal points to be attended to; and if the house to be erected is to have a wall at the back, with a glass lean-to roof, it ought always to slope to the south if possible; or, if the aspect cannot be direct south, the next

best is the south-east. When the house has a span roof, with glass all round, the aspect is comparatively of little consequence, and the doors are generally placed east and west; it should, however, be open (that is, free from the shade of trees) to the south.

The principal use of all kinds of plant-houses is to form habitations during winter for plants which grow naturally in climates warmer than our own, and which would be killed by the cold if they were suffered to remain in the open air. A secondary object is to force hardy plants into flower at unusual periods, so as to be able to have those flowers during the winter months, which, under ordinary circumstances, could only be obtained in the middle of summer. In both cases it is necessary that the plant-houses should be much warmer than the open air, and this is effected, partly by fire heat, and partly by affording the plants the full advantage of the heat of the sun, by the houses having sloping roofs of glass.

It must always be remembered, both in the erection of plant-houses, and in the culture of exotic plants, that fire heat is not sufficient without the aid of the sun; as certain chemical changes take place in the sap, while it passes through the leaves, which cannot be effected without the agency of solar light. As exotic plants, being the natives of hot countries, are generally, in their natural habitats, exposed to excessive heat from the sun, they, of course, require still more aid from solar light than the inhabitants of temperate climates, which, in their natural state, are not exposed to such powerful solar rays; and consequently every expedient that can be devised should be adopted to increase the amount of solar light in the houses devoted to the reception of exotic plants. The best mode of doing this is to place plant-houses in open situations, where they can enjoy the full force of the sun's rays, and yet be sheltered from cold winds. From motives of economy, it is also desirable to place plant-houses in a sheltered situation, open to the sun, not only because the sun does very materially increase the heat of the house, but because, when the houses are in an exposed situation, the amount of heat which is carried off by winds that are at a lower temperature than the surface they pass over is very great, and of course the amount of fuel required to raise the atmosphere to the required degree of heat, will be proportionately increased.

Construction of Plant-Houses.—All kinds of plant-houses, however they may differ in the minor details of construction, must agree

in some important points; as, for example, they must all have some contrivance for supplying them with heat, and all must have a glass roof; and therefore I shall make a few general observations on the various modes of heating plant-houses and glazing them, before I enter into the details of constructing those which I propose to describe.

Heating Plant Houses.—Various modes have been proposed of heating plant-houses; but all may be reduced to three or four kinds, viz., heating by hot air, by hot water, and by steam, to which may be added occasionally by gas, though this last mode is seldom used. In heating by hot air, or by hot water, it is essential to provide a place for the furnace, and this place, which is called the stoke-hole, is generally made underground, the entrance to it being either in the open air, or in a shed at the back of the plant-house, where the fuel is kept, together with empty pots, implements, &c.

The most simple and economical mode of heating by hot air is, no doubt, by smoke flues; the smoke flue being, in fact, a kind of chimney carried all round the house, through which the smoke passes before it is suffered to escape into the atmosphere. In constructing a house of this kind, it is only necessary to have a small close fireplace or stove closely adjoining the plant house, and to contrive it so that a great portion of the heat shall pass with the smoke into the chimney or flue, which is carried into the house, and generally passes horizontally just under the front windows, being suffered to rise vertically, like an ordinary chimney, at the farther end of the house. It is obvious that this plan is extremely simple, but yet there are some difficulties attending its management. In the first place the heat is irregular, as it must necessarily be greater at the end next the stove than it is at the opposite side of the house, and if a very strong fire be made, there is not only danger of burning the plants where the flue enters, but also of bursting the flue by an explosion of gas, by the escape of which a whole house of plants is sometimes destroyed.

Burning the plants by excessive heat often arises from inattention; but when the flues burst, it shows that the gardener is ignorant of the proper management of fires. When fresh fuel is to be added, the fire should be pushed forward—that is, farther into the furnace, and the fresh fuel should then be laid on the part the clear fire before occupied; the gas which escapes from the fresh fuel will then be ignited by passing over the clear fire, so that it will not

reach the flue. A great portion of the smoke will also be burnt. This will apply to all furnaces.

Heating by hot water is very preferable to smoke flues, as the temperature to be maintained is much more equal. In heating by hot water, a boiler is placed over the fireplace, having two pipes in it, one much higher than the other. As the water warms, it is forced through the higher of these pipes, just as water boils over in a kettle, from the natural tendency of heated fluids to ascend; and as the water becomes cold in going round the house, it returns to the boiler through the lower pipe. This is the principle upon which all the modes of heating by hot water depend, though they differ exceedingly in the size and shape of both the pipes and the boiler.

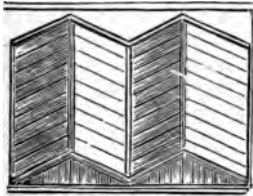
It will be observed, that it is scarcely possible to burn plants in a house heated by hot water so long as there is plenty of water in the boiler, as there cannot be, for any length of time, a greater degree of heat in one part than in another, since the more rapidly the water boils, the more swiftly will it circulate. There is also as little danger of the plants being suddenly chilled, as, though the circulation will become less rapid as the water cools, a languid degree of circulation will continue, and thus a degree of warmth will be diffused through the house till the water has become quite cold.

The Glass Roofs of Plant Houses are of four kinds, viz., lean-to, span, curvilinear, and ridge and furrow. The lean-to is the most common, and a house built in this manner consists of an upright wall, with a sloping glass roof, the slope varying from 25° to 65° , rarely the latter angle, but most generally forming an angle of from 25° to 45° . The span roof consists of two lean-to or sloping roofs fixed together in the highest part, instead of being attached to a wall. A curvilinear roof is usually shaped like a dome or semi-dome, the sashes being generally fixed in frames of iron, or some other metal, which are curved into the desired shape; and a ridge and furrow roof may be compared to a number of small span roofs joined together.

Several plant houses have been built with what is called the ridge and furrow roof (see fig. 38), which was employed by the late Sir Joseph Paxton at Chatsworth, and which has also been used in many other places. The advantages of this mode of building are that the roof does not require to be raised so high behind as in ordinary cases, because the descent of the water does not depend upon

the general slope of the roof, but on the slope of the ridges towards the furrows; secondly, that the morning and afternoon sun, enter-

FIG. 38.



A portion of a ridge and furrow roof.

ing the house at right angles, produces more light and heat at those times of the day; thirdly, the rays of the sun striking at an oblique angle on the house at noon, the heat produced at that time is less intense than in a house of the usual form; fourthly, more light is admitted at all seasons, on the principle that a bow window always admits more light to a room than a straight window of the same width; and lastly, that the wind can have much less influence in cooling the roof, because the sides of the ridges will be sheltered by their summits. Ventilation is given by opening the glazed triangular panel in front of each ridge, which is hinged on its lower side; and by opening shutters of similar form and dimensions in the back wall under the upper part of each ridge. It is right, however, to mention that a roof of this kind is somewhat more expensive than one constructed in the ordinary manner.

Glazing Plant Houses.—Various kinds of glass are used for this purpose. Formerly, the very worst kind of glass, which was discoloured and full of knots, was used, but this has been long discovered to be a false species of economy, as the chemical changes which give colour and fragrance to the flowers and flavour to the fruit can only be effected under a strong sunlight, and imperfect or discoloured glass impedes the effect of the rays of the sun. The effect of coloured glass in diminishing light having been discovered, some cultivators have adopted blue glass for those plant-houses in which they grow camellias, orchidaceæ, and other plants that require shade. The plan, however, has not been attended with success, particularly with regard to orchidaceæ, which, when grown in this manner, were found to be deficient both in beauty and fragrance. Recently, however, Mr. Ingram, of Belvoir Gardens, reports the best results from placing some azaleas and other plants under green glass. The size of the panes is another object in which a great change has taken place within the last few years. Formerly, small panes of glass were preferred on account of the expense in case of breaking, and they were laid over each other with broad laps to

keep out the air. It was soon found, however, that the water lodged in these broad laps, and that it was very apt to break the glass by freezing. Another objection to the broad laps was, that the space between the two glasses was very apt to become filled up with earthy matter, and that consequently it formed a great impediment to the light. In consequence of these discoveries, the laps were diminished from one inch to less than one fourth of an inch, and various expedients were contrived for filling up the space between the panes with lead or putty. Most of these, however, are now rendered unnecessary by the excellence and comparative cheapness of glass, and the fewer laps and panes we have the better.

There are various kinds of Plant Houses, but, as I have already stated, most of them are unnecessary for amateurs. In fact, many have only one plant-house, which serves at once as a greenhouse and a vinery. When this is the case, however, it is impossible to grow greenhouse plants in their full beauty, as every plant should have a season of repose, during which it is not ornamental, and is best kept out of sight; or if it remain in the greenhouse where it is kept growing all the year, it becomes still more unsightly, till at last, it possesses no beauty at any season. It is, therefore, necessary to have some kind of place behind the scenes in the shape of a flower-house or pit, if the object is to keep up a display of flowering plants in the greenhouse; and to have a cold-pit, and a hotbed for striking cuttings, where the object is to raise a great number of greenhouse plants for planting out into the beds in the open garden. A conservatory is often found attached to one of the living-rooms of a villa, and hence it is desirable for an amateur to understand something of its management. I shall, therefore, describe some greenhouses, a vinery, a conservatory, a flower-house or pit, and a cold-pit, as all these plant-houses may be managed by an amateur, with the assistance of a house-servant or garden labourer: but I shall not attempt to describe pineries, or forcing-houses for peaches and other fruit trees; or, in short, any of those houses which cannot be properly managed without the aid of a professed or master gardener.

The Greenhouse.—As a greenhouse is designed for the reception of a number of small plants in pots, which should be kept near the glass, it does not require to be very lofty; indeed plants usually grow better in small low houses, such as are generally to be seen in nurseries, than in those that are more ornamentally constructed.

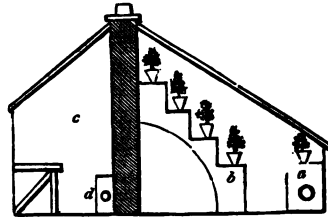
If the house is to be detached, it may have glass on all sides to within two feet of the ground; the ends should be circular, and be placed north and south. A wooden, stone, or slate stage for the plants should occupy the centre, which should be surrounded by a walk two feet and a half or three feet wide: round the sides and ends next the glass, and at the height of the brickwork, should be a trellis fifteen inches wide. If heated by hot water, the pipes should be placed beneath this trellis, and if by flues, they must occupy the same place.

As, however, it is generally most convenient to make use of a wall or building already erected for the back of a greenhouse, the common lean-to roof, as shown in fig. 39, is in most cases preferred. The house should not be less than twelve feet wide; the front and ends to within two feet of the ground should be glass; the back twelve feet high, and the front five or six feet, viz., two feet of nine-inch brickwork, and the remainder upright glass sashes. A wooden, stone, or slate stage should occupy the back of the house, leaving four feet or four feet six inches for the path and front trellis; the latter should be fifteen or eighteen inches wide, and at the height of the brickwork; the pathway should be three feet or three feet three inches wide, and under the front trellis should be placed the heating apparatus, whether flues or hot-water pipes. The stage should commence at eighteen inches from the floor of the house, and slope gradually upwards to the back, leaving only a narrow pathway behind for the convenience of getting at the back plants. A door at each end will be found most convenient, as the visitors will not then be obliged to turn back after seeing the plants. The lights or sashes should be four feet wide, and their frames should be made of the best yellow deal; the sash bars may then be made very slight. There must be two sashes, and if the upper one, which should be contrived to let down to give air, is made shorter than the lower one, it will be found to work much easier, besides being less liable to strain the rest of the building. The front sashes may be made to slide up and down, the same as a common window sash; or they may be hung by the centre, so as to push open at the bottom, the top part of course opening inwardly. If possible, the floor of the house should be at least six inches above the ground level; and there should be a sink-stone and drain at one corner of the house, the pavement being laid so as to fall to it. The stoke-hole should be at one corner, at

the back, if the house is against a wall; but where it is against a building, the stoke-hole must be placed where most convenient, and least seen; where there is room, the shed enclosing the stoke-hole should also be fitted up with a potting bench for shifting plants, shelves for pots, and small compartments on the floor for the various soils used. There are now several modes of heating greenhouses, but for a common greenhouse where a fire is not often wanted, a common flue well constructed will be found the cheapest and best. The dry heat of the common flue is of advantage to greenhouse plants, as it serves to dry up damp during winter and spring, which is often more destructive to plants than cold. Fig. 39

shows a section of a greenhouse of the simplest construction, with a lean-to roof, and heated by water-pipes (*a*). There is a wooden stage (*b*), which is so contrived as to enable the proprietor to have a great many plants in a small space; and there is a shed (*c*) containing the stoke-hole, or fireplace for the boiler, and a potting-bench. In this case the shed is represented as a little room, with a lean-to opaque roof, and a window just above the bench used for potting on. If, however, it be an object to save expense, the shed may be merely a roof supported on pillars, and it may serve as a repository for the different kinds of composts, decayed leaves, and other substances. In some cases the shed is used as a mushroom-house, and shelves are placed against the upright wall which forms the back of the greenhouse, for growing mushrooms, forcing rhubarb, or growing any other plants which do not require the aid of light. In this case an additional pipe may be carried through the shed, if thought necessary, as shown at *d*.

FIG. 39.



Cross Section of a Greenhouse.

FIG. 40.

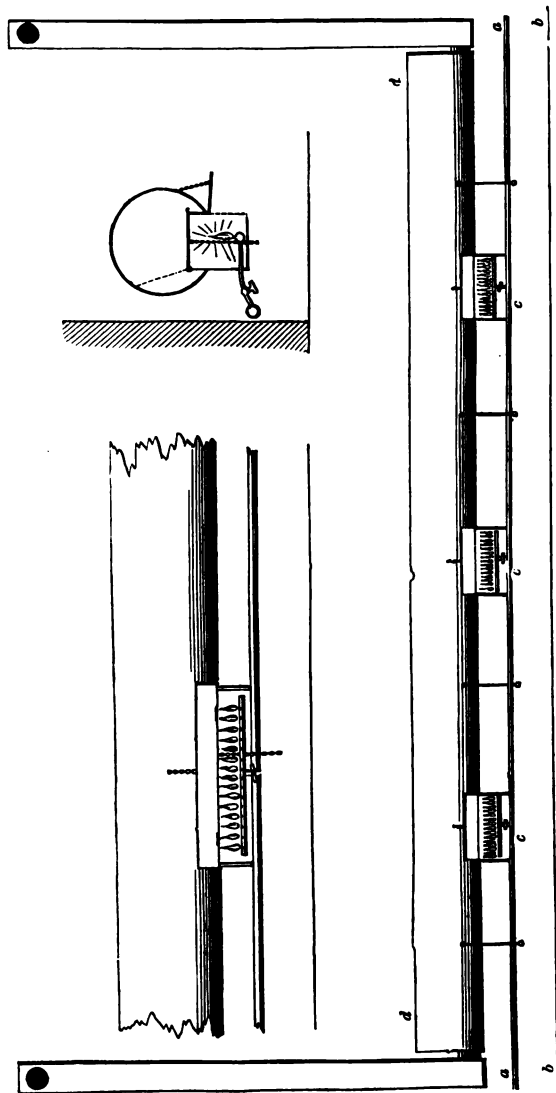


Mode of placing large Plants in a common Greenhouse.

Though greenhouses are generally intended only for the reception of small plants, some of the larger bulbs may be introduced occasionally by means of an opening cut in the front shelf, as shown in fig. 40.

A greenhouse heated by gas is shown in figs. 41 and 42. A gas-pipe (*a a*), one inch in diameter, enters at one end of the greenhouse and extends throughout its whole length, being carried along the front wall about two inches above the floor (*b b*); and there are three burners (*c c c*) attached to it, each being nine inches long, and perforated with fifteen holes. The burners are about five feet apart, and the stalk of each is furnished with a stop-cock for turning the gas off or on at pleasure. Parallel with the one-inch gas-pipe, and immediately above it, is fixed on brackets another pipe (*d d*) seven inches in diameter, with as many holes on its under side as there are burners, each hole being two inches and a half wide, and exactly of the same length as the corresponding burner. Each opening in the large pipe is so contrived as to make the upper part in that pipe serve as a sort of bottomless box over each burner, having the side next the greenhouse made to lift up by a hinge. It will thus be perceived that the gas is, in fact, burnt in the large pipe, and that when the side which is hinged is let down, it effectually prevents any light being seen in the greenhouse; it also prevents any unpleasant smell escaping, as the colder and denser air, resting upon the floor of the house, presses up the heated or lighter air in which the combustion of the gas is taking place, and forces it along the large tube through which it passes, diffusing warmth during its progress. Attached to the ends of the horizontal seven-inch pipe are two upright two-inch pipes for conveying away the smell arising from the burning gas, as well as the water which is formed by the combination of the hydrogen liberated by the gas, with the oxygen of the atmosphere. It must be observed, that the upright pipes should be fixed at the bottom of the large pipe, as unless this is the case, the heated air, which of course rises to the upper part of the large pipe, would be carried off too rapidly. In fixing the pipes to carry off the vapour, it will be best, at the joints, to insert the upper piece into the lower, not put it over, as is usually the way; by this arrangement the water, which is formed in great quantities, will drain down to the bottom of the perpendicular pipe, where it may escape through a small hole. It must also be observed, that each opening in the large pipe is furnished with a lid

FIG. 41.



Details of the mode of heating the Greenhouse at Old Brompton by Gas.

to close it entirely when the burner belonging to that opening is not lighted, as, unless this were done, there would be a rush of cold air into the house when none of the burners were lighted, and an escape of the gas when only one or two of the burners were in use. The burners not in use would also corrode from the condensation of the moist heated air which would flow through the openings if they were left unclosed. In this instance the large pipe is of zinc, but as this metal has not sufficient stiffness to answer the purpose completely, one of iron coated with zinc would be preferable.

It is much better to heat a greenhouse in the ordinary way with a good form of saddle boiler and hot water pipes, or even with a good flue, than in the way described above. If gas be employed, let it be employed somewhat after the fashion of the following method. A new mode of heating small greenhouses and conservatories by gas and hot water has recently been adopted by Henry Craigie, Esq., of Falcon Hall, and the following account (extracted from the "*Scottish Gardener*" for December, 1856) will give some idea of this gentleman's invention:—"Mr. Craigie has a small greenhouse fitted up with pipes in the usual way, but instead of heating the water by a fire, he employs the flame of gas for this purpose; and in order to obtain the utmost amount of heat, he applies the flame and the heat arising from it to an extensive water surface, so that no more heat than what is required to keep up the draught may escape from the flue. A ring burner, with a Bunsen lamp in its centre, is used, and the heating surface is extended by placing tubes, in which the water may circulate, across the flues. The boiler in this case is placed in the under flat of the house, and pipes carried up from it to the greenhouse on the second flat. During an inspection of the apparatus, the gas was applied to the boiler in order to show how quickly the heat could be got up; in ten minutes from the time the gas was lighted, the heat was sensibly felt by applying the hand to the pipes, and in an hour and a quarter the water was boiling throughout. The ease with which the apparatus is managed, its cleanliness, and the smallness of the space which the boiler occupies (being about 2 ft. high by $1\frac{1}{2}$ ft. wide) recommend it strongly for heating small conservatories, &c., as the inconvenience of a furnace, the expense of an attendant, and the risk of overheating, are all avoided. Mr. Craigie deserves great credit for the way in which he has applied himself to bring to practical utility his very ingenious invention."

FIG. 42.

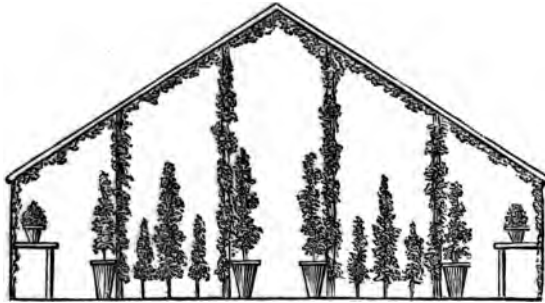


General appearance of the Greenhouse at Old Brompton, heated by Gas.

The want of a simple and effective heating apparatus has always been felt as a great drawback to the proper enjoyment of a miniature greenhouse attached to the house."

The Conservatory.—The conservatory is essentially larger than the greenhouse, as it has not the advantage of the stage, and is in-

FIG. 43.

*Cross Section of a Conservatory.*

tended for the reception of plants of large size. When the conservatory is detached from the house, it should be glass all round;

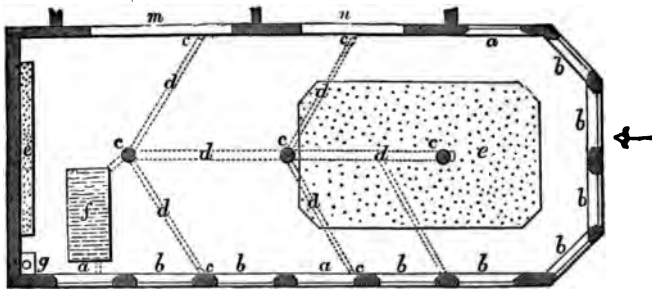
FIG. 44.

*Elevation of a Conservatory erected at Alton Towers.*

and it may either be built with a span roof, with iron pillars for the climbing plants, as shown in fig. 43, or more architecturally, like that shown in fig. 44, which represents a conservatory designed by Mr. Abraham, and erected at Alton Towers, the seat of the Earl

of Shrewsbury. When attached to a dwelling-house, it may be somewhat in the style of the conservatory described below, which was built by a common bricklayer and carpenter, in the neighbourhood of Nottingham; and, though forty-three feet long, and eighteen feet wide, the cost was little more than 250*l*. Fig. 45 is the ground plan, in which *a a a* are three doors, each dividing in the middle; these doors are hung upon Collinge's patent hinges, and are lifted on and off with the greatest ease. The letters *b b* are Gothic lights or windows, resembling the doors. The letters *c c* are cast-iron pipes, conducting the rain water from the roof-gutters into the drains (*d d*) which carry it into the tank (*f*). The letters *e e* are beds containing soil best suited to their respective plants.

FIG. 45.



Ground Plan of a Conservatory erected in the neighbourhood of Nottingham.

The tank (*f*) is twelve feet square by ten feet deep, arched over, and covered with a moveable flagstone at the mouth, supplying the pump (*g*) through the bottom of the trough of which the waste water is again returned into the tank; *m* is a glass door opening into a library, and *n* a similar door opening into a drawing-room. The roof is a double span, as shown in the cross section, fig. 46, in which *l l l l* are the rafters on which the lights rest, exactly in the same manner as those of a common cucumber frame; with the addition of a slip of wood, five inches wide, extending from the ridge to the

FIG. 46.

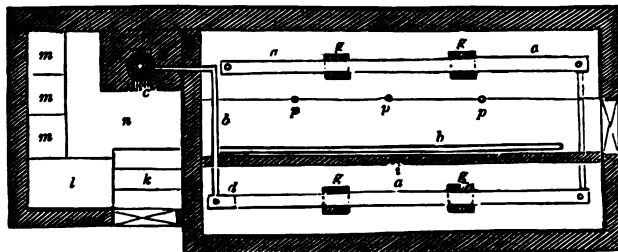


Cross Section of the roof of the Conservatory erected in the neighbourhood of Nottingham.

gutters along the rafters, to cover the outer woodwork of the lights. Without this, the rain would find admission down the openings of the sides of the lights. These slips of wood are essential to the dryness of the house; and if the two or three screws with which they are fixed are well greased, they may be readily taken off from such lights as are removed during the summer. The three leading gutters (*h h h*) should be wide enough in the centre to admit of a person walking along them; *c* is one of the cast-iron pipes, forming a pillar nine feet high, supporting the longitudinal beam, and having five small wooden rods round it, to train climbing plants upon. The ventilating shutter (*l x*) works upon two pivots, and is raised by a wooden rod, which also props it open.

The Forcing-House or Pit.—As this house is not intended to be ornamental, it may be of the kind denominated a pit—that is, it

FIG. 47.

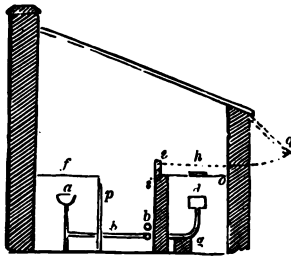
*Ground Plan of a Flower-house erected at Tonbridge Wells.*

may be sunk into the ground, and entered by means of descending steps. The roof of a pit is generally much more flat than that of a greenhouse, and in some cases the slope is not more than 12° or 15° . A flower-pit is indeed something between the frame of a hotbed and a hothouse, and when it includes any material that will afford the plants bottom heat, it is as efficacious in propagating or forcing plants as a hotbed, while it possesses the facilities for examination of a plant-house. As these houses are perhaps more useful than any other kind, I shall give two or three examples, all of which I know to be really good, as they have been erected, and are in constant use.

Figs. 47 and 48 show the ground plan and cross section of a flower-house erected for a gentleman residing at Tonbridge Wells,

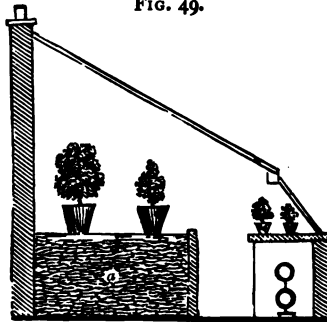
and which is admirably suited for an amateur. In these figures *a a a* are hot-water troughs with covers; and *b b b* hot-water pipes; *c* is a boiler; and *d d* show the situation of the cistern by which the boiler and pipes are filled. The space marked *e* in the section is filled six inches deep with sea-sand, for plunging pots filled with cuttings; *f*, which is a back stand for plants, has a wooden bottom; and *g g g g* are brick piers to support the hot-water troughs; *h* is a wooden cover, placed over a hole in the slate (*o*), which covers the cistern (*d*); and *i* is a four-inch wall with three iron doors built into it for the escape of heat if necessary; *k* shows the steps to the stoke-hole; (*n*) in the shed; *l*, potting-bench; *m m m*, divisions for different kinds of soil, with racks for pots over; *n*, stoke-hole; *o* is a

FIG. 48.



*Cross Section of a Flower-house
erected at Tonbridge Wells.*

FIG. 49.



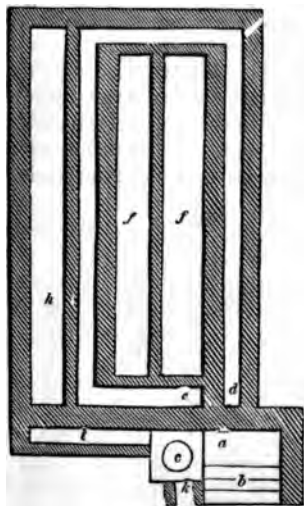
*Cross Section of a Forcing-house
erected at Brooklands, Blackheath.*

slate cover to the front stand, on which is placed six inches deep of sea-sand; *p p p*, supports to the back stand; and *q* the front light shown open. This house is used by the proprietor as a propagating and flower forcing-house. It also contains several choice stove plants; and roses, bulbs, and various kinds of shrubs have been forced in it. Seakale and rhubarb have been grown under the back bench, and the potting-shed is very compact and complete. This house is heated by Burbidge and Healy's boiler and iron troughs, and that mode answers admirably. The ground plan and section of this house are drawn to a scale of a quarter of an inch to a foot.

Fig. 49 shows the cross section of a forcing-house erected at

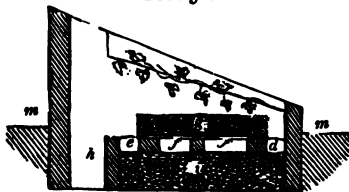
Brooklands, Blackheath. In this house the pit *a* is filled with bark or dead leaves; and the front sashes are placed obliquely, because more light can thus be admitted to the plants in winter.

FIG. 50.



Ground Plan of a Pit erected at Hagley.

FIG. 51.



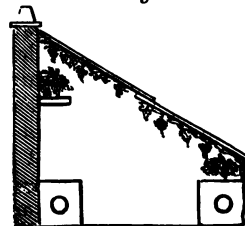
Cross Section of a Pit erected at Hagley.

Figs. 50 and 51 show the ground plan and cross section of a pit erected at Hagley, by the gardener there, Mr. Robson. The pit, which is sixteen feet by nine feet, was put up in May, 1845, and has proved all that could be desired. It is sunk below the level of the ground, as shown at *m m* in the cross section fig. 51; close to the steps, *b* in fig. 50, is the fireplace, *a*. The pit is heated partly by hot-water troughs, and partly by hot-air chambers. The troughs are eight inches wide and six inches deep, and they are lined with cement half an inch thick, to about half their depth, that is, above the level of the water which circulates in them, which is generally two inches and a half deep, though Mr. Robson thinks one inch and a half will probably be enough. The hot-water troughs are fed from the boiler, *c*, by a flow-pipe, which proceeds from the boiler in an oblique direction to *d*; and the water returns to the boiler by a short pipe from *e*. The hot-water troughs are covered with blue slates, the joints of which are laid in cement, and which are firmly fixed in the walls by a course of bricks being set an inch back to form a bearing for them. The space enclosed by the troughs is divided into two hot-air or steam chambers (*f f*), which are divided up the middle by a brick wall.

The hot air or steam is admitted into these chambers from the hot-water troughs, by the bricks in the upper course of the wall which divides them being placed two inches and a half apart, so as to form a series of pigeon-holes. The hot-air or steam chambers are covered with wooden slabs laid close together, and on these is placed the bed (*g* in fig. 51), which is about seven inches deep, the sides being made of bricks set in cement. In some cases the hot chamber is covered with slates, which form the base of the bed. The bottom of the pit below the troughs and air-chambers should be filled with gravel, brick rubbish, or any similar material, which should be rammed perfectly firm and level. A box, six inches deep and eight inches wide, filled with sawdust or any similar material, may be placed over one of the hot-water troughs, and will be found very serviceable for striking cuttings. Four circular three-inch holes are cut in the slates which cover the front trough, for letting the steam out into the pit when necessary; and a three-inch cylindrical tile is placed in the middle of the bed, to enable the gardener to ascertain the heat of the steam-chamber below, by letting down a thermometer. The path through this pit is shown at *h*, and the lower part, which is made firm with gravel, is shown at *i* in the section. The fire that heats the boiler of this pit, when required, also heats a pit twenty-eight feet by seven feet, which is in three divisions, and so contrived that only one or two of these divisions may be heated if no more should be wanted. The heat, when required for this pit, is conveyed from the boiler by the flues *k* and *l*, which are regulated by dampers. This pit may be used as a melon and cucumber bed, as a flower-forcing house, or as a vinery.

The Vinery.—Though vines are frequently grown in a greenhouse, the shade thrown by their leaves is so injurious to the greenhouse plants, that where practicable, they ought to be grown in a house by themselves, or at the most with camellias and such plants as do best in the shade along with them; it is better, however, only to grow strawberry plants or kidney beans, if wanted a little before the ordinary time. Fig. 52 shows a very appropriate form for a vinery, which

FIG. 52.

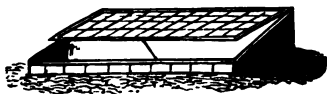


Cross Section of a Vinery.

differs principally from the greenhouse shown in fig. 51, in not having a stage for plants in the centre, and in having holes left in the front wall for the admission of the vines.

The Cold Pit.—The cold pit is an excavation, lined by walls of brick, generally from four to nine inches thick, on which is fixed

FIG. 53.



A Cold Pit.

a frame with glass lights like those used for melon and cucumber beds. Great care should be taken to secure sufficient drainage for a pit of this kind, since it is intended to preserve plants during the winter without the aid of fire

heat; and to do this it is essential to keep the plants dry. Fig. 53 shows a pit of this kind.

The Orchard House.—This is a comparatively modern structure, first suggested by Mr. Rivers, and now a favourite with many amateurs. Those about constructing one would do well to provide themselves with Mr. Rivers's book, and also with Mr. Pearson's, both on the orchard house. The best orchard houses in England are undoubtedly those in Mr. Pearson's nursery at Chilwell, near Nottingham. Mr. Pearson's advice on the subject of building orchard houses is valuable. "Having had eighteen houses erected within the last few years, each being an improvement on the former ones; and seeing that Mr. Foster, who built them, and is largely engaged in their manufacture, is constantly making improvements in their construction, I have arrived at the conclusion that amateur building is a mistake. It appears advisable to take advantage of experience acquired at other people's expense rather than make mistakes at our own cost. The houses built by Mr. Foster, of Beeston, near Nottingham, are by far the best I have hitherto met with. They are constructed of all sizes, adapted to the requirements of the smallest or the largest establishments, and they are not only of an ornamental, but a durable character. The mode by which Mr. Foster ties the span of his houses, and renders them firm in their construction, is particularly meritorious, and far superior to anything I have yet seen for strength and elegance. It is perfectly novel in design, and has been secured by a patent. A conservatory or orchard-house ought to be constructed so that ladies may enjoy a walk in them with no more feeling of constraint than in an open garden; to be able to cut a flower, reach a peach,

or water a plant without difficulty, is essential to the enjoyment of such houses. It is not sufficient to be able to get inside, exclaim, 'How beautiful!' and wish to be out again as soon as possible. Similar objections may be urged against covering peach walls with glass; a covered wall is no place for enjoyment; but for the production of fruit, irrespective of all other considerations, no one can take exception to such houses as those erected at Dalkeith, which though they may be called covered walls, are wide enough for a row of dwarf trees in front, and a path down the middle. Having often heard the remark, 'If I were living on my own property I would have an orchard house immediately,' I have great pleasure in calling attention to Foster's patent moveable house on iron supports. It is as strong as any house can be built, and yet may be taken in pieces and removed without difficulty. The feet, pillar, and bracket are all cast in one piece. The roof is made in separate lights, and also the ends and sides, so that there is no occasion to break a pane of glass in removing the whole structure. I have a house erected on this principle, 60 feet by 24, heated by six rows of pipes. It is used as a conservatory, and is a beautiful building. Many persons will remember a storm of wind from the west which occurred on the 3rd of December, 1863. In the neighbourhood of Nottingham it did a great amount of damage, blowing down timber trees and unroofing houses. By that storm many greenhouses were much injured, some having their sides blown quite in, others being partially unroofed. This moveable house proved so much stronger than any house merely resting on brickwork, that, excepting the noise, no one could tell a storm was blowing. It will be easily understood that a house having iron pillars every 10 feet, forming part of its sides, must be of immense strength; and when we take into consideration the great pressure of wind on a house 90 to 100 feet long, stability is a matter of great importance." I can, from personal examination, testify to the great merit in every way of these houses recommended by Mr. Pearson. They are described in detail in Mr. Pearson's little book.

Garden Enemies.

Birds.—The blackbird is generally destructive in this month to the cherries and some other crops; and the house sparrows are very destructive to peas.

Insects.—Soon after midsummer, the destructive insect called the *turnip-fly* begins to attack the young turnip plants; it also attacks Brussels sprouts. This insect, though called a fly, is in fact a small beetle, having such extraordinary powers of leaping that it might be called the turnip-flea. It is generally seen as soon as the second crop of turnips (which is sown early in June) appears above the ground, and it is in the perfect or beetle state that the insect is most destructive, although it first exists as a grub. The only remedy appears to be brushing the turnips with a kind of bag-net (fig. 54). There are three distinct species of this insect: the

FIG. 54.

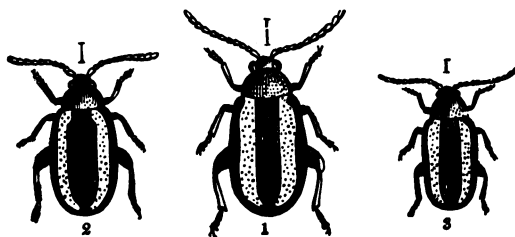
*Bag-net for brushing off the Turnip-flea Beetle.*

common turnip-flea beetle (*Haltica nemorum*, fig. 55, 1), which is of a brassy black, with a brownish stripe on the wing-cases, and buff legs; the black turnip-flea beetle (*H. intermedia*, fig. 55, 2), which has a black body and black legs; and the small turnip-flea beetle (*H. parallela*, fig. 55, 3), which is black, with a pale buff streak on the wing-cases, and black legs. These creatures are not much larger than a flea.

The *onion-fly* is another insect which is very destructive in kitchen-gardens at this season. "During the summer months, and

especially in June and July," says Mr. Westwood, "the cultivator of onions is annoyed by perceiving that here and there, in various parts of his beds of this vegetable, the plants appear to be in a dying state, and the leaves fallen on the ground. At first this is observed in plants which are only just above the surface of the soil, and which are not above the thickness of a straw. These soon die, and then others, of a larger size, are observed to decay in a similar manner; this continues until the middle of July, and even until the onions are full grown; at which time they have occasionally sufficient strength to survive the injury, with the decay of a portion only of their outer layer or root, the centre part remaining sound. In this manner whole beds are destroyed, and it seems to be of little use to sow again, as the fresh-sown plants fare no better.

FIG. 55.

Three species of *Haltica*.

In light soils especially, the attacks of this insect are occasionally very annoying to the gardener. On stripping off the coats of the young onions which show evident signs of decay, it is at once perceived that it is owing to the attack of a small grub, destitute of legs, upon the vital parts of the bulb or stem of the plant, that its destruction is occasioned. On pulling up a very young onion (fig. 56, c), its interior is found to be completely devoured by a single grub at its very heart; but in plants of larger growth I have counted at least half a dozen of these grubs, varying considerably in size (fig. 56, b). In the summer season the grubs are about a fortnight in arriving at their full growth. They generally consume the whole of the interior of the onion, the outside skin of which is alone left dry and entire, serving as a place in which they undergo their

transformations, without forming any cocoon (fig. 56, *a*). In about another fortnight the perfect fly makes its appearance, the time varying according to the season, from ten to twenty days. The grub, or larva (fig. 57: *a*, natural size; *b*, magnified), is moderately long and cylindrical, but more conical towards the head, which is of a variable form, furnished with two minute tentacula. The body is fleshy, naked, shining and white, with twelve distinct segments. The breathing pores of the first segment of the body are yellow, and the terminal segment is broad and obliquely truncate, with about eight obtuse points, of a consistence similar to the rest of the body. Near the extremity of the body are observed two small reddish spots, from which proceed two

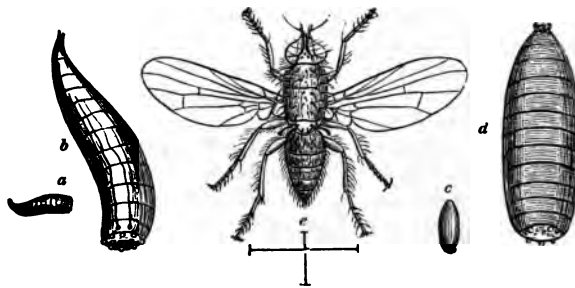
FIG. 56.

*The Onion attacked by the larvæ of the Onion-fly.*

internal and dark-coloured veins. Bouché gives the length of the insect as a quarter of an inch, but those which I have reared were nearly half an inch long when full grown. When this period is arrived, the larva, by degrees, contracts itself in length without throwing off its outer skin, and very shortly appears as an oval mass (fig. 57: *c*, natural size; *d*, magnified), of a chestnut colour, having its posterior end blackish, with the extremity red, and with two large black spots, corresponding with the spots described near the end of the body of the larva. In this state it is brittle and shining, without very distinct traces of segments, but the head is furnished with two obtuse points; and the points observed at the other end, in the larva, are also still to be perceived, two of them

being rather larger than the rest. Within this puparium the real pupa is to be found, having the limbs laid along the breast." The perfect insect, or onion-fly (*Anthomyia ceparum*, fig. 57, *e*, magnified, the cross lines indicating the natural size), is of a pale ash-colour; the female, which is here figured, having the abdomen of the same colour as the body; but in the male there is a black line down the middle. The body is covered with long black bristles, and there is a broad chestnut line between the eyes, forked behind. The wings have scarcely any colour, but are rather buff at the base, with a pink and green iridescence. The legs are black, and the poisers and winglets are of a pale yellow. The female is said to deposit her eggs on the leaves of the onion, close to the earth;

FIG. 57.



The Onion-fly in its different states.

but in fact by means of her long telescope-like ovipositor, she is enabled to lay them between the tunics or coats of the bulb, and thus the young maggots find their food ready prepared for them the moment they are hatched. There are several other insects nearly allied to the onion-fly, which are very injurious in gardens; as, for instance, the *cabbage-fly* (*Anthomyia brassicæ*), and the *lettuce-fly* (*A. lactucæ*). The insects of all these species bear considerable resemblance to the common house-fly, excepting that the wings are clearer, and have a tinge of buff. They are easily destroyed by dressing the ground with soot; and their ravages are said to be effectually prevented by strewing powdered charcoal over the onion-bed when the seeds are first sown.

The beautiful green beetle called the *rose-chaffer* (*Cetonia*

aurata) is often seen in the month of June, burying itself in the centre of a rose; and sometimes three or four of these beetles are found in one rose. The larva of this insect is a large thick white grub, and when it goes into the pupa state it buries itself in the ground, and gathers together any bits of old half-rotten wood it can find, to make its cocoon. The perfect insect is very beautiful, from the golden-green hue of its wing-cases; and it is curious in its habits, as it imitates death with such exactness as to deceive almost any observer, and then watching its opportunity, it spreads its wings and flies away so abruptly, and with such a buzzing noise, as to startle the person who had caught it. This beetle is seldom injurious except to the strawberry beds, which it attacks early in June: the only remedy is picking the beetles off with the hand, and then destroying them.

The *apple moth* is busy during the month, and if precautions are not taken against it now it will be too late to act when the apples are rendered worthless by its ravages. Mr. Francis Francis has successfully combated with this pest, and thus describes how he deals with it in *The Field*:—

“My apples, particularly some of my espaliers, have for years been almost cleared of fruit by this horrid little pest. I have been disgusted to find again and again a splendid promise of a crop, and before the season was over nine-tenths of the fruit bored through and spoilt. I have thought of various methods of eradicating or of mitigating the pest. I tried scraping and searching the bark of the trees for the grubs, and dressing with Gishurst, &c. I tried trenching the earth beneath them, and exposing it to the hardest frosts, and even removing it and replacing it with fresh; but it was of no use. This year I fully intended having some grand field-days, or rather nights, against the moth itself, with lantern and net and catch-em-alives; but unfortunately, at the end of May, about the time of the moth's appearance, I had to leave home, so nothing was done. Lately, accordingly, I began to find my small apples being bored, when I became possessed of an idea, which I impart for the benefit of your readers. The moth lays an egg in the calyx of the apple when it is in an immature condition. This egg turns to a very small grub about the time that the young apple is formed. It sets to work and eats its way to the core, devours or destroys the seed, out through the other side, and into another apple, serves that the same, and, having done its will with it, on to another, and so on,

until the grub, being full fed and greatly increased in size, crawls out and bestows itself somewhere, either in the earth or bark of the tree, to become a moth and lay many eggs in due time.

"That the grub passes from apple to apple is certain. Take two apples off the same bunch, you will find corresponding holes touching each other in them, and all covered with dirty brown exudation. Cut one up, and you will find the grub has pierced it entirely, and that it has left it; cut the other, and you will find the puncture only as far as the core perhaps, and then you will find the little grub. I have frequently seen them just emerged from a hole, and working their way into a fresh one in another apple. In the early part of June the grub is as small round as a very fine pin or a moderate needle. Later on, as we all know, he gets to be as big round as a fat wheat corn, but that is not till he has pierced many apples. Now, this being the case—and that it is so I am sure—my notion is this, and I am diligently acting on it: on all the trees I can get at I search very carefully, and every apple which I can find bearing any mark of the grub's handiwork—and it is very easily detected—I carefully pick off, and have them burnt or destroyed in some way. By pursuing this method at the present time, I shall considerably reduce it as far as my garden is concerned; but if I do not quite succeed in that, at any rate I shall certainly save a respectable share of my fruit—enough for a fair crop. Had I gone to work earlier, I should have saved a big one on some trees. I find that the topmost fruit is attacked first.

"To give some idea of the terrible ravages of this dreadful little pest, I will cite two instances. I took a great number of pierced apples of my espaliers, still, however, leaving a very good crop indeed behind; and as I find that very few of those apples left are now touched, as I search day after day, I hope that I am pretty safe for a crop, which I am sure I should not have been had I attended to the trees later. Having finished them, I turned to some of my smaller standards, such as I could conveniently, by the use of steps, search all over, unfortunately losing some days between. The first tree I looked over was a young Wellington, some five or six years old, just coming into nice bearing. I picked 196 apples, or more than four-fifths of the crop, off that tree, which had been pierced by the grub. There may be two or three dozen or so left; if there are, it is the outside. I then went to a Nonpareil, a great natural bearer, an older and larger tree. Off this I picked 515 apples

one afternoon, and 94 the next morning. This was perhaps five-sixths or more of the crop. In both instances the crop left was very small indeed for the tree; while but for the moth it would have been very large. Had I looked at these trees as early as I did at the espaliers, I am convinced that I should have saved at least half the crop, or more. It would be a curious experiment, easy to try, to take some of the grubs out of apples (as may easily be done), and to place them on new ones, so as to gauge their rate of destruction from day to day. It seems strange, considering what a dreadful pest this is, that we are not better up in its habits and powers. I feel sure that by attending to the apples early in June, as soon as they are formed, and picking off all that show signs of boring, a good crop may be saved, if gardeners will give themselves the trouble, while they will certainly do much to save their trees from a like visitation next season."

There can be no doubt that Mr. Francis's mode of dealing with this pest is a sound one, and worth the attention of every gardener.

JULY.

General Observations and Directions.

The Weather, &c.—On the 3rd of this month the “dog days” begin, which are a certain number of days before and after the rising of the dog-star in the morning, about the same time as the rising of the sun. The dog days last from the 3rd of July till the 11th of August, and consequently they comprise the hottest part of the year; and as at this season canine madness is generally very prevalent, it was formerly imagined that the term “dog days” alluded to there being more danger of dogs going mad at this season than at any other. The first fortnight of the month is often intensely hot and dry; but about the 15th, which is St. Swithin’s-day, it sometimes rains, and continues wet during the remainder of the month. Thunderstorms are extremely prevalent at this season.

Open Garden.—The flower garden is now, or should shortly be, in all its brilliancy, and keeping it in presentable condition the chief care of the period. Beyond that there cannot be much actual work with it; but there may be a good deal of pegging down in some cases, and in such, if pegs run short, bits of mat are quite as good as anything that can be had, and very much cheaper. Cut it into strips from a foot to eight inches long or thereabouts, and then, by passing a bit over a shoot, meeting the two ends, and giving them a good firm deep prick into the earth with a wooden dibber, or even a very strong finger, they will hold as well and firmly as any, while they are free from objections that some iron and other pegs are liable to. Make a list of bedding plants likely to be most wanted for next year, and study the planting of the most tastefully planted gardens you have access to. The rose comes in for so much admiration at this season, and contributes so much to enhance the splendour, fragrance, and beauty of the garden, that we are sure even those who do not trouble themselves with the culture of other

plants will not begrudge a little attention to that which was the "queen of flowers" when Sappho sang, and still retains that proud position. Now begins the season for rose budding—a very interesting and profitable garden amusement for ladies and gentlemen alike. It should be done on quiet cool days, or in the mornings or evenings. It is the very time to go over the stock, comparing old with new varieties, to decide upon the effect of next winter's plantings, and on the sorts most worthy to predominate, and, if convenient, to visit some of those large rose nurseries in which new and old kinds are usually grown in abundance, and as well as it is possible to grow them in this country. Gather the fading blooms daily, which practice will much improve the appearance of the plants, and perhaps the ladies may like the petals for their perfume jars. If so, they should be placed in a shady airy place to dry.

We may now also easily strike roses from cuttings as well as carry on the pleasant operation of budding. The cuttings should be taken from the half ripe shoots, or such as have flowered, and put singly in small pots in a gentle bottom heat in a shaded frame, which should be closed and well shaded during the day, but ventilated at night. Keep them from flagging by sprinklings rather than heavy waterings. Dahlias are at this season likely to require attention; and if their situation is not very rich and well cultured, a little weak and clear liquid manure will prove beneficial.

Plants of all kinds are now growing so rapidly that staking must be frequently attended to, and neatly and judiciously done. It is usually performed in a very slovenly and bungling way, the plants being tied into a close bundle, regardless of the fact that they look much better when allowed to straggle about, or even when flattened down by storms, than tied into an awkward bundle. Then again, the stake is too often allowed to project over the top of the plant, or in other ways exhibit itself. Stakes of all kinds are intended as supports, not disfigurements, and should be kept out of sight as much as possible. It is not uncommon, even in large gardens, to see the stakes more conspicuous than the plants in some instances: in all such it is better to abolish both stakes and plants, and lay the space down in green turf, if subjects that do not want "setting off" with sticks and stakes, for the exhibition of which a garden was never intended, cannot be found.

It is usually so hot at this season, that watering must cause con-

siderable labour, and too much cannot be said as to the necessity of providing the handiest and cheapest means of performing it. Every amateur should have a handy water-barrow. The best form to choose is the one with a removable tub, so that the carriage may be employed in carrying water to any part required by one man, while another man or boy distributes the water. The best way is to have three tubs, so that one may be left to fill at a tap while another is being carried to the place where the water is required. It is there deposited, and the one that has been emptied taken back, to replace the one at the pump—or, handier, at a tap. This is a great improvement upon the old method of watering, and indeed a great saving of labour and time, doing away with the severe labour of dragging water in pots.

Whenever during the month cuttings of both variegated and green bedding geraniums can be obtained, they should be put in. They root more certainly and regularly by being stuck rather closely over a bed of rather fine and sandy yet well prepared soil, in the full sun, than in any other way, though it is not unusual for people to go to much unnecessary expense and trouble in their propagation. The mode is to dig up a border, sandy if it can be found, throw it into little beds, say three or four feet wide, and stick the cuttings all over it in close lines, say three inches apart in every way. They may want an occasional watering if the season or soil is unusually dry, but are often rooted regularly and abundantly without the slightest shade, water, or attention of any kind after being inserted. They should be firmly put in with the finger or a small blunt dibber.

The numerous seed vessels that remain on rhododendrons after flowering should be removed as early as possible, as of course if allowed to ripen they weaken the plant. The practice is not so desirable in case of large plantations of the common kinds (ponticum, &c.), because these generally grow rapidly enough; but with the finer coloured and rarer kinds it should be carried out. Fruit should now be protected from the birds by netting. It is often desired to keep gooseberries, currants, &c., late, but from the way they are generally pruned and trained it is very awkward to net or mat them. By planting them in lines, say at three feet apart, and training them as little espaliers, all that has to be done to net them safely is to pass the nets over several lines together, so that the gatherer may slip in at one end and do his work with the

greatest convenience. The old way of netting or matting each bush is simply absurd, and rarely tends to preserve anything but the net and labour bill. For cherries, &c., on walls it is different, though a modification of the plan would be sure to succeed with them also. Such fruit hang a long time if unmolested by the birds.

Take care to secure sufficient strawberry runners for forcing and for the making of new plantations, and attend to the gradual and careful summer pruning of wall fruit. The tomato is an excellent vegetable, which we rarely enjoy sufficiently, or produce abundantly. Of course the climate has a good deal to do with this, but by a little attention we may induce them to fruit better than they generally do. In all but the warmest parts of the country it is best to grow them against walls—and here, as usual, they generally run to a great mass of leaves. By training them out constantly and pinching out superfluous side shoots here and there, we may prevent that, and permit of every fruit being perfectly exposed to the sun. It is also a good plan to thin out the fruit, so as to allow all the strength to go to the best and earliest formed, and late in the season to entirely remove the young bunches of fruit formed, as there is no chance of their ripening. It is right to pinch the foremost leaflets off, to allow of every fruit, and all the foliage and shoots that were left on, being fully exposed to the sun and heat, which this plant likes so much.

Do not let the vegetable marrows and gourds run all to great fruit ; by cutting them persistingly when at the proper size for eating, a much greater crop is secured. Ground should be got ready at the end of the month for spinach and turnips, a good supply of both vegetables being a great aid in the autumn, winter, and spring. As a rule, light, rich, and warm ground, with a good aspect, should be chosen for these things. Ground should also be prepared for winter greens of all kinds ; Brussels sprouts and brocoli, more especially Snow's, Backhouse's, and Osborne's early kinds, will claim the first attention and best position. Savoy and curled greens may follow anywhere where there is a vacant space. Now is the right time to sow that most useful vegetable, the Rosette colewort. This is the most useful and delicious green in cultivation, and from it nice little compact cabbages may be cut all the winter through. Its medicinal properties are recognised by the faculty, and in some cases it has been recommended as the only green which an invalid ought to eat. This no doubt arises from the

delicacy of texture, and the almost total absence of woody fibre in the plant. Lettuce and endive for the autumn supply must also be sown. For this purpose the brown cos kinds are the most hardy, and perhaps the sugar-loaf brown cos is the best of the section, especially for compactness and long keeping. The Paris cos, white and green, are good for early use. Of the cabbage kinds Tom Thumb is yet prime for quality, though the Malta and All-the-year-round are good. Rampion may yet be sown upon light soil, and in addition to the nice nutty-flavoured radish-like roots which it affords through the winter, the leaves of it are in early spring the best possible substitute for lettuce. Used for a spring salad it is difficult, except by the eye, to know it from lettuce. As it is perfectly hardy, this is a fact worth knowing.

Make the principal sowing of Battersea cabbage or other good early varieties for autumn planting; also some red cabbage. Sow some winter spinach in rich ground, and early Horn carrot in a light soil, also the black and white Spanish radishes for winter use, and the various small saladings if desired. Peas should be sown for the late supplies; if you have the option, sow exactly on the top of an old celery drill. Peas sown now should be kept cool and richly fed to get them over the heats of summer without bolting off to a puny crop of pods. Do not begin to earth up any celery but the very early crops, as by doing so nothing is gained. During its rapid growth in hot weather, it is better to leave the trench open and hollow. Celery, not earthed till it has first made a tall, vigorous, and luxuriant growth, is generally better even in point of blanching than when banked up too young. Plant out stiff young plants for a main crop in trenches, with a bottom of well-rotted manure. If you have an opportunity to abundantly water celery, do so by all means, especially if the weather be dry. Such things as garlic and shallots should be taken up and stored in a dry place.

Indoor department.—At this season numbers of glass houses, &c., are quite empty, and it is the very best time to get them thoroughly cleansed, painted, and repaired, so far as may be necessary; the cleansing is indispensable in any case.

The various species of achimenes are very commonly grown in stoves as late summer and autumnal ornaments. They require stove warmth to start in; but when coming into flower they should be put into the greenhouse or conservatory, where they will bloom longer and better than in a warmer house. One, called *A. longiflora*

(a fine blue kind), is particularly effective when placed to flower in a conservatory ; and they may also be used, with much taste, as basket plants. The modern flower garden is, to a great extent, occupied by plants that must be propagated annually ; and when the propagation is not taken in hand early, it is the cause of much inconvenience and of much loss. Therefore the cultivator should now begin to take cuttings here and there from his rarest and newest plants in the first instance. All kinds of verbenas are the better for being struck early, and exposed to the open air for some time, after being thoroughly rooted. When so treated they never go off like the "miffy" weak plants struck late in autumn. Chrysanthemums in pots should receive their final potting ; and, above all other plants, they should be abundantly supplied with water twice a day on very hot days during the next two months. If any one plant more than another likes a good dose of clear well diluted liquid manure it is this. Layer carnations and picotees, and take care that the main stem is securely staked, or some heavy wind with rain may do them a deal of damage. Strike chrysanthemum cuttings to make dwarf plants for the windows or the small greenhouse benches in autumn. They may be struck under hand lights, but it is better to put them in their blooming pots at once. Select some six-inch and eight-inch pots, fill them with rich, loamy earth, and then take off and put in the cuttings round the edge and in the centre of each pot ; one kind only to go in each, of course. As chrysanthemum cuttings are generally to be had in quantity, a dozen may be put in each pot, tops of the old plants to be used as cuttings. The bits pinched off the old specimens when stopping them will do capitally for cuttings. Place the pots in shaded frames till they are struck, then pinch the small points out of each rising cutting, place the pots in open air, half plunged in coal ashes ; and those pots of cuttings will make the neatest and prettiest specimens that could be desired. They should be trained out a little during the autumn, but not stopped more than once. Pompons should be chiefly used, though the larger kinds will also do. Towards the end of the month sow seeds of the herbaceous calceolaria for next spring bloom, and in gentle heat. The possession of a well grown group of calceolarias in spring adds a great charm to the conservatory or greenhouse. They are by no means so easily grown as cinerarias or shrubby calceolarias, being liable to go off or become yellow and sickly from

very slight and often unknown causes. The best way to manage them is to sow in a gentle heat—say in what is known to gardeners as an intermediate house—and keep them in that all through the autumn and winter, potting them during those seasons as they require it; and then, as they get strong in early spring, introduce them gradually to the greenhouse and cold pit. In the intermediate house they should be kept rather moist during the day by a gentle syringing. A slightly warmed pit is also a capital place for them. When sown they should be covered with the slightest pinch of fine earth; the pan to be afterwards shaded with a newspaper till the plants are up. Grapes intended to hang late should be thinned very freely, so that the berries, when fully swelled, will scarcely touch each other. Give abundance of air in the houses where the fruit is colouring, leaving a little on at night.

Things not to be done in July.

Never allow azaleas or any other choice shrubs to perfect their seed, unless wanted, as it weakens them very much. This holds good with nearly all plants.

Never water shrubs during hot dry weather without at the same time slightly loosening the surface of the soil, and after watering, mulching with some half-rotten manure or the short grass from the lawn.

Never water any plant with water from a spring or pump, unless it has been fully exposed to the atmosphere for several days. River or pond water should always be preferred for gardens, or rain water when it can be obtained.

Never stimulate half-hardy plants that are permanently planted against walls; check their growth as much as possible without actually injuring them.

Never pinch all the shoots of a wall or espalier tree all at the same time. Begin at the top, to which point the sap flows with greatest vigour, and pinch several of the upper branches of a horizontally trained tree before touching the lower ones.

Never shade or over-water melons ripening fruit. The less water they obtain when approaching the ripe stage the finer will the flavour be; and no finer melons were ever cut than those that received no water for a month previous to ripening.

Never allow tomato plants to become masses of luxuriant foliage against the bottoms of walls. The shoots should be kept thin and free of each other on the walls, so that all the foliage and fruit left may fully enjoy the sun and the heat ; and for this purpose also the fore parts of the leaves of the shoots left may be pinched out.

Never, if possible, use the rake in beds or borders. The weeds, if hoed in time, will be withered up by the first hour's sun ; and the rake is really needless in the cleaning of a large garden.

Never defer the propagation of verbenas beyond this month, if a good stock well prepared to stand the winter is required. This also applies to any choice kinds of bedding plants.

Never clip laurel hedges or bushes with a shears, but use a knife, so that half cut leaves may not disfigure them.

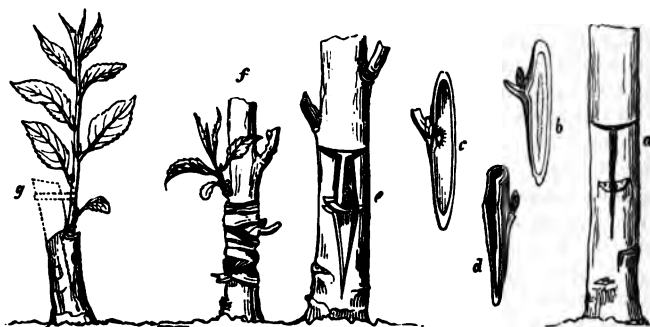
Never go to needless trouble in the propagation of the now universally popular bedding pelargoniums. They strike with unvarying success on the open borders, even without being shaded.

Principal Operations in July.

Budding.—Budding consists in uniting the bud of one tree to the stem of another, by introducing a portion of the bark adhering to the bud under the bark of the stock, by means of a slit made in the latter ; and it is essential to the success of the operation, that a portion of the bark of the bud should adhere to it, and should be made to supply the place of a portion of the bark of the stock. There must also be a small particle of wood left adhering to the bud, and this must be pressed against the naked wood of the stock, so that an intimate union may take place between them, and that the descending sap may enter into the wood of the stock, as it would have done into the wood of its own tree, if it had not been removed. When budding is to be performed, the first object is to select a stock and scion which bear a sufficient relation to each other to warrant the supposition that they can be united by budding ; as unless a certain conformity exists between them, the bud will wither instead of beginning to grow ; for instance, an eatable fruited tree will not succeed well upon a tree which bears its seeds in a dry capsule ; and the bud of a stone fruited tree will not grow well on the stock of a kernel fruited tree. Buds of peaches, nectarines, and apricots succeed perfectly well on plum stocks ; but they

would not take on stocks of the crab or the hawthorn. Sometimes there is a degree of uncertainty even in this, as it might be supposed that peaches and nectarines might be budded on the cherry as well as the plum; but this does not seem to be the case; and even the pear does not appear to succeed well when budded on the apple, though it was tried some years since successfully by M. Cordonnier, at St. Denis, near Paris. Pears have also been budded on the hawthorn, but with very moderate success. There are various kinds of budding, but what is called *shield-budding* is almost the only kind practised in this country. When a proper stock has been selected, a longitudinal incision is made through the bark, which is

FIG. 58.



The different steps in the process of Shield-budding.

crossed at the upper end by a similar horizontal cut, so as to make the whole of the incision resemble the letter T, as shown at *a* in fig. 58. Great care must be taken to cut completely through the bark without wounding the wood; and a small knife is used, called a budding-knife, which has a flat, thin, bone handle, that is used for raising up the bark of the stock on each side, after the cut has been made, so as to admit of the bark of the scion being pushed under it. The incision may be made either in the trunk of the tree, or in a branch, and it is generally considered best, when practicable, to make it through a bud, so that the introduced bud may take the place which would have been occupied by the natural one. In choosing the bud, a healthy leaf is selected, which has a fine, well-

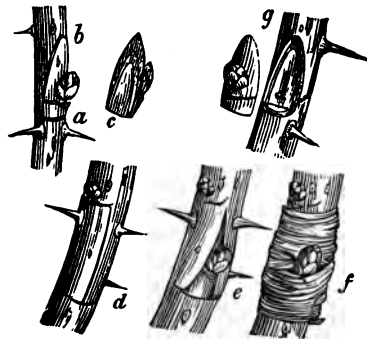
formed bud or eye at the base of its footstalk, and an incision is made above, below, and on each side this eye, so as to cut out the bud with a portion of the bark attached, the latter being from an inch to an inch and a half in length, and the bud being one-third of the length distant from the top. No care is taken in this case to avoid wounding the wood, and indeed a portion of the wood is generally slit off with the bark containing the bud, as shown at *b*. The white wood, thus slit off, is then separated from the bark, taking care, however, to leave a little speck just under the bud, which gardeners call its eye, and without which it will not grow. This is done by holding the piece of bark containing the bud, which is called the shield, by the leaf which was left on it with one hand, and entering the point of the knife at the under extremity of the shield, and between it and the thumb; and then raising and drawing out the wood by a double motion outwards from the bark, and downwards from the upper to the lower extremity of the shield. The bud being now prepared, as at *c*, the bark on each side of the slit in the stock is raised up by the spatula end of the budding-knife, and the shield inserted beneath it; its upper part being cut straight across, as at *d*, so as to admit of its joining accurately with the inner bark of the stock, as at *e*, so as to receive its descending sap. A bandage of soft matting is now applied, so as to exclude the air from the wounded parts, and to show only the bud and the petiole, as at *f*, and the operation is complete. In a short time the bud begins to develop its leaves, as shown on the left side of *f*; and the following spring it will produce a shoot of some length, as shown at *g*, which is tied for some months to the upper part of the stock; but that part of the latter which is indicated by dotted lines is cut off in July—that is, twelve months after the bud was inserted.

The principal points to be attended to in this operation are, the taking out the splinter of wood from the scion properly, and making the bark of the bud adhere closely to the wood of the stock. Sometimes in taking out the splinter of wood from the scion, which is done with a quick jerking motion, the base of the bud, which is woody, is torn out also, leaving a small cavity instead of an even surface, and when this is the case, it is better to throw the bud away; and sometimes a cavity is left between the bark and the wood, and in that case, contact between the organizing surfaces of the stock and scion does not take place, and the bud perishes. It is therefore essential that the inner part of the bark of the bud should adhere

closely to the naked wood of the stock ; as on the closeness of this union it is that the success of the operation depends. As soon as the operation is completed, the stock should be bound tightly round with a strand of bast matting, so as to keep the bud exactly in its proper place. The leaf, at the axil of which the bud lies, was formerly cut off, but it is now generally left on, and when it falls naturally, it is a sign that the bud has taken, and is beginning to grow ; and when this is the case the matting ligature may be loosened : though it should not be removed till the bud has produced a shoot of some length.

Budding Roses.—The first thing to be done is to select a young shoot of the current year, from which the bud is to be taken, and

FIG. 59.

*Budding the Rose.*

a stock of one of several years' growth, into which the bud is to be inserted. The operation may be performed in the same way as has been already described ; or the bud may be cut out by making a transverse cut into the wood, a little below an eye (see fig. 59 *a*), which incision is met by a longer cut downwards, commencing a short distance above the eye (*b*), care being taken that a portion of the wood is removed with the bark (*c*). The bud is then inserted into the bark of the stock, which is cut like an inverted T (*d*), and the horizontal edges of the cut in the stock and of the bud must be brought into the most perfect contact with each other (*e*), and then

bound with waterproof bast (*f*), without, however, applying grafting clay. When this operation is performed in spring, a notch is made in the stock, as at *g*, and the bud is cut with some wood in it; the bud is fixed exactly into the niche with a slight pressure, and then tied on as usual. The Cuba bast mat is said to be the best to use for tying on buds. The French now use the dried and afterwards moistened stems of the bur reed (*spargarium ramosum*), a plant wild by the sides of streams and ponds in Britain, and find it answer perfectly.

Making Layers in the Flower Garden.—A layer is the branch of a plant which is twisted or wounded so as to prevent the free circulation of the sap, and to occasion an accumulation of it to be deposited in the part just above the obstruction, which is buried in the ground, in the hope that the warmth and moisture by which it is surrounded may induce it to send out roots. In general, the layer is cut half through at the bend, and partially slit up, the projecting part being called the tongue. In all cases the object is, as Dr. Lindley expresses it, "to prevent the return of sap from the layer into the main stem, while a small quantity is allowed to rise out of the latter into the former;" the effect of this being to compel the returning sap to organize itself externally as roots, instead of

passing downwards below the bark as wood. The mode of making layers of greenhouse plants has been already detailed; and the chief difference as regards plants in the open air, is that several layers are frequently made at the same time from one plant, as shown in fig. 60, which is called a stool, the branches which are to form the layers being pegged down so as to make a circle round the main stem. It is in this manner

FIG. 60.



A Stool with several of the Shoots layered.

that shrubs are generally propagated in nurseries.

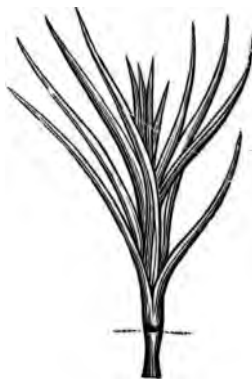
Laying Carnations.—This operation should now be performed, and it is one that requires great care. In the first place, the shoots that may be chosen should be divested of the leaves which grow on that portion of the stem which is to be buried in the ground. The soil should then be lightly loosened about the roots of the plants,

and a little fresh light sand or sandy loam should be laid on. In the next place, a sharp penknife should be passed, from a little below a joint, half through the under side of the shoot to be layered, and passed up the shoot nearly to the next joint. The shoot should then be bent down to the ground, and pegged in that position with a small hook; the slit part being afterwards covered an inch deep with the same kind of sandy soil as that laid over the roots of the old plants. A gentle watering should be occasionally given in dry weather.

Cuttings resemble layers, except that they are entirely separated from the parent stem, and each cutting consists of a portion of a branch, containing two or more buds, as it is only from the buds that either the leaves or roots can be developed. A cutting is always cut through at a joint or node—that is, at the place from which a bud springs; and the object is, that the sap sent down by the upper buds, which was intended to form the woody part of the plant, shall produce roots. In preparing cuttings a portion of the leaves is taken off; but only those should be removed which would be likely to decay from being partially buried in the earth, as the others are essential to organize the matter of which the roots are to be formed. When the cutting is put into the ground, the earth should be made quite firm to its lower end; as, if any space be left below it, the roots will wither as soon as they shoot forth.

Pipings of Carnations and Pinks.—Pipings are cuttings of carnations or pinks, which are taken off when two or three inches long. They are cut off just below a joint, and the leaves are taken off that joint and the one above it. A warm shady situation is then chosen in the garden, and the soil having been removed to the depth of three or four inches, the space is filled up with light sandy earth; the bed is then watered thoroughly, and while the soil is wet, the pipings are put in so as to bury two joints in the soil, as shown in fig. 61. They should then have a slight sprinkling of water, and as soon

FIG. 61.



A Piping of a Pink prepared and planted.

as they are dry, hand glasses should be put over them. If a slight hotbed could be spared for the pipings, and they could be planted in it instead of being put into the ground, it would greatly facilitate their growth.

Bedding Pelargoniums.—All the bedding pelargoniums, or geraniums as they are improperly called, may be propagated with the greatest ease in the open borders without shade of any kind, and it is needless to take more pains except in the case of very rare varieties. How to select the best varieties of the various sections is, however, of importance to the amateur, and therefore the following selection by Mr. Hibberd, who has devoted much attention to pelargoniums, is given.

“Within the past few years the raisers of new varieties have succeeded in effecting numerous improvements, and to speak the plain truth, the geranium is now quite a different thing from the plant we were accustomed to when we used to call them ‘scarlet-flowered horseshoes.’ Nearly all the kinds that were then considered first-rate are now second, third, and fourth rate, those of most recent introduction being so immensely superior.

“Let us, then, just consider the two points together—diversity of colours and superior qualities for bedding. To begin with scarlets: we put aside Tom Thumb, Huntsman, Reidii, Hibberd’s Pet, Cottage Maid, and several others that only three years ago were considered first-class varieties, and we take instead of them Stella, Cybister, Faust, and Attraction. These are certainly the four best scarlet bedding plants known; they grow with only moderate vigour, they are extremely neat in habit, with dark green horseshoe leaves, and they produce large trusses of flowers of the most brilliant shades of scarlet or scarlet crimson. Perhaps of the four, Cybister is the best; but in any extreme case, the ultimate choice must fall upon either Cybister or Stella. The dark foliage of all these varieties has very much to do with the brilliant effect they produce on the ground, because by contrast therewith the strong tones of colour of the flowers come out distinctly. All the scarlet-flowered geraniums that have light green leaves, such as Tom Thumb, are objectionable, because of the interference of the predominant tone of yellow in the leafage with the purity of the scarlet flowers.

“Let us glance at another section—say the rosy pink class. There are now hundreds of varieties with pink flowers, and a few of them are excellent bedders. Not long since we were glad of Helen

Lindsay, Mrs. Whitty, and some others that surprised us by their colour, but which have proved rather shy in flowering out of doors. For colour, profuse flowering, neat dwarf habit, and hardy constitution, there is no geranium in this section to equal Madame Barré; it is a better colour even than Helen Lindsay, which used to be the richest, though the shyest, in this section. It has the bad quality, however, of shedding its flowers during gales and heavy rains, so that after a few days' bad weather beds filled with it look rather poor; but it produces such abundance of flowers that a few days of sunshine make it right again, and it glows as bright as ever. There is a good old variety in this section that we cannot now do without—it is the well-known Christine. All the breeders have tried their hands at raising a geranium to beat Christine, but none have succeeded yet. It is very faulty, yet very good. Its greatest fault is the immense quantity of seeds it produces; if these are not assiduously removed, the beds acquire a most unsightly appearance, and the plants get exhausted and go out of bloom. The good qualities are a dwarf habit, most profuse flowering, a good cheerful colour, and a capability of thriving on almost any kind of soil. After these two we may find several good varieties with pink flowers, such as Beauté des Suresnes, a truly magnificent kind, which, to tell the truth, is almost too good to plant in beds, and has been hitherto generally grown in exhibition collections as a pot plant. Where the climate is warm, and the soil rather light, however, it may be planted out with perfect safety, and it will make superb masses. Princess Alexandra, in the style of Christine, flowers very profusely, and is for a time more attractive than any other in this class; but it makes seeds so fast that before the season is over it becomes a nuisance, and moreover it is apt, after making a tremendous blaze, to go out of bloom altogether by about the 1st of August. Pink Beauty, Rose Rendatler, Rose Queen, and Minnie are all good bedders, the last two being of a paler shade of colour than Christine.

“Let us next look at the purples; and before naming the best it may be well for those who know Purple Nosegay and Mrs. Vernon to call to mind what are their qualities of growth and bloom. Having done so, look at a fair-sized plant of Amy Hogg when in full bloom, and by the contrast measure the advances made in the improvement of geraniums within the past few years. The late Mr. Beaton, who was the most successful breeder of these things in

modern times, left us no better legacy than Amy Hogg; for, though it is not equal to Stella or Cybister in the profusion of its flowers, the predominance of blue in the colouring is a step in the right direction, and the flower is a great gain. In this section we must place Lord Palmerston, in whose complexion there is but a trace of blue, yet enough to justify me in classifying it with the purple section.

"It is an easy transition to Imperial Crimson, Merrimac, Miss Parfitt, and others of what we may call the crimson section. But the moment a grower of these things has seen Black Dwarf, he pronounces all of the Imperial Crimson class to be rubbish; and with Black Dwarf alone he might be content, for its thumping trusses of crimson flowers are magnificent. Another beauty of this class is Glowworm, which has the top petals salmon, and the bottom petals vivid crimson, with just a tinge of purple to make the flower glow with a sort of metallic lustre. Glowworm has just the same fault as Madame Barré—the petals fall much during wind or rain. All the shaded crimson kinds are more or less shy. One called Magenta, which is most exquisitely coloured, blooms so poorly that I cannot recommend it; a round dozen others, which I should be glad to name because I like them, must be passed over for the same reason.

"The greatest contrast that can be made with geraniums alone is to be accomplished by placing masses of crimson and purple kinds, such as Amy Hogg and Black Dwarf, in juxtaposition with kinds that have a predominance of yellow in their flowers. I may therefore appropriately turn now to what may be called the yellow section, and respecting which it must first be said that we are as destitute of a true yellow as we are of a true blue; but the nearest approach to it is Indian Yellow, the colour of which may be described as a mixture of salmon, red, and drab; it is not at all attractive, and its colour, at the best, is very impure. Yet, if a line or bed of this, and another line or bed of Amy Hogg were put side by side, the contrast would be admirable; Indian Yellow would look more yellow, and Amy Hogg would look more blue, by the help of the complementary, than would be the case were they separated far asunder, so as to be viewed irrespective of the influence of contrast. Hibberd's Pet is still valued in some places for the large predominance of orange in the flowers; but it is not here recommended, for it is rather too robust in habit, and the flowers are small. Harry

Hieover and Harkaway, both of them very old varieties, are much valued for their orange tints, and, as they are both of very small wiry habit, they may be used for edgings with effect where an orange tone of red would be appropriate.

"Again, we make a transition to the salmon-coloured section; and here the best bedder is undoubtedly Jean Valjean. Another superb bedder is Eugénie Mezard, which is also known as Madame Rudersdorff. This is a first-class exhibition geranium, and when grown in pots under glass, the flowers are white, with a beautiful oculate painting of clear salmon flesh. But when planted in the full sun the flowers come self-coloured, and a very pleasing shade of salmon. It is first-rate for either pots or beds. There are very many bad varieties in this section, such as Kingsbury Pet, &c., which it would be waste of space to name.

"We turn next to the whites, and the first remark required is, that as bedders none of them are first-rate. Mme. Vaucher, White Tom Thumb, White Perfection, and Snowball do not greatly differ in habit and general appearance; in a certain sense they are all good, and the two very best among them are Mme. Vaucher and White Perfection. Their great failing is this—if the summer is as bright as we desire it to be, and as geraniums usually require for a free growth and good bloom, the flowers of these varieties lose their purity and become coloured in various degrees of dirty blue, pale red, blush, and other tones for which I can find no name. In 1864 there was a bed of Mme. Vaucher at Battersea Park, which the most experienced of geranium growers would not have identified until told the name, for the flowers were all of the colour of a washed-out lilac calico, instead of pure white, as they ought always to be. All these geraniums require some amount of shade to preserve the pure white of the flowers, and so long as they do keep pure they are extremely beautiful. There is a good old variety which I still use as a bedder, and which I recommend cultivators to procure and try fairly—it is called *Galanthiflora*; the name is appropriate, for the flowers are as white as any snowdrop, and where the soil assists it, the flowers are produced abundantly. In many country places *Hendersoni* is the only white geranium at present known. Respecting it all that need be said is, that it is about the worst geranium in cultivation.

"There remain a few yet that deserve mention, as, for example, Lady Middleton, a rather strong grower, but of excellent habit, the

flowers lively cerise red. Trentham Rose is so nearly like it that one description serves for both. They are distinct, though very few can see the distinction. Sheen Rival is an excellent scarlet. Herald of Spring and Excellent are two fine varieties, the colour light red.

"Of variegated-leaved geraniums, the following are unquestionably the best for bedding: Alma, Flower of Spring, and Silver Chain in the white-leaved section; and Cloth of Gold, Golden Vase, and Mrs. Pollock in the yellow-leaved section. At least a hundred more good ones could be added to the above, but possibly these will suffice for the majority of our readers."

The propagation and wintering of the Verbena.—Amateurs do not succeed so well in increasing and preserving over winter the verbenas as the pelargonium. The verbenas are very nearly hardy, but somehow or other more difficult to keep over the winter with most people than many plants much more tender. The reason is that the plant is often struck late, and presented to the winter, so to speak, in an attenuated and "drawn" condition. In that state it, above all other plants, soon perishes from any slight cause. Many gardeners depend for their stock of verbenas upon spring-struck plants, and some retain a few old plants in pots to supply the cuttings in spring—a good practice. In any case we must strike a good many at this time of the year, and the sooner the better. Few have taken the precaution to pot some plants some time back, and plunge them, so that they might be ready to take up in autumn and preserve nicely over the winter. Old plants taken up from the beds and potted in the autumn generally perish. I have been particularly successful in the propagation of the verbenas, so as to leave it in a condition to stand any amount of damp or vicissitude in the winter without losing a leaf; and how I managed this was to strike the cuttings as early as possible, and, once struck, to place them in the open air for some weeks before there was any occasion to put them in frames, so that they might make some sturdy growth in the open air before requiring any protection. Then they are ready for any change, and may be kept over the winter as easy as the most vigorous of geraniums. As for the striking of them, I have sometimes done it under hand lights in the open ground; but that was generally very early in the season—a few weeks earlier than this. By shading the hand light they were found to do very well in this way; but generally a gentle

hotbed will be found the best place. The verbena abhors a dry atmosphere when in the cutting state, and yet it may be quite overdone with the moisture of a gentle hotbed. Now, the way to humour this character is to keep the frame close in the daytime, and give air at the back at night, when evaporation is slow, placing the frame, if convenient, with its back to the sun. If you give air during the daytime, most likely the cuttings perish from evaporation; but you may do so with impunity at night, and it will at the same time tend much to keep the cuttings from being drawn. As soon as they are rooted, they should be taken out of this frame, kept in a slightly shady place for some days, and then pinched and gradually exposed to the full clear sun. They should be placed upon slates, or ashes, or boards, or anything to prevent the earth-worms entering at the bottom. As for the spring striking of verbenas, it is the simplest of all operations, every bit growing, no matter how put in; but in the autumn more care is required. They may be struck and preserved over the winter either in pots, earthenware pans, or rough and cheaply put together wooden boxes. When once they are well exposed to the open air (or rather have made a firm and sturdy growth in it), they may be removed to the frames as soon as there is danger of any weather that will hurt them. I have preserved them with the greatest success in melon pits, standing on the soil in which the melons grew, and without any fire-heat whatever, merely giving them a little protection with mats, &c., in very severe weather; but as the verbena is a pretty hardy plant, it was very rarely necessary. Treated in that way they did not look as verbenas generally do in winter, but had more the aspect of plants growing in the open air in summer, and were able to supply six times the number of cuttings in spring than plants struck in the ordinary weak and flimsy style could do.

The Fuchsia.—The fuchsia is so very popular and easily grown that doubtless the amateur will at this season be tempted to add to his collection, and no plant is likely to repay him better. It is not often that we find the highest beauty of flower combined with elegance of habit in a plant, but the fuchsia possesses both qualities in a supreme degree. In addition, it is varied perhaps more delightfully than any other plant in cultivation. What with kinds having scarlet sepals and dark corollas, or rose or lavender corollas, those with white sepals and purple and scarlet corollas, and those with double white and double dark purple or blue corollas, we have

a variety that is really surprising, especially when it is considered how widely different many of them are from the few original kinds. The white kinds, it is well known, are of garden origin. Unlike many good things, the worth of the fuchsia is abundantly recognised by the horticultural community, but scarcely so much so as some things of smaller merit. When well and freely grown, no plants are better for the summer and autumn decoration of the conservatory, they are so well fitted by size, beauty of flower, and pendulous habit to grace the choicest. They may be grown so freely that they are among the best things to use for house decoration, inasmuch as if they do suffer from a stay indoors, they are readily propagated, and no real loss is incurred. It is such things that we should use for indoor decoration, and not valuable stove plants, or scarce, slow-growing, or difficult-to-be-grown subjects from any department. Some people introduce their choicest and rarest plants into the house, and afterwards perhaps expect them to look as well as in places where a breath of dry or unwholesome air is carefully kept away from them.

As a house plant the fuchsia is of the easiest culture. Rich light soil, genial moist steady heat through the spring months, cleanliness, which may be easily preserved by gentle but regular and dense syringings, are the means by which good plants may be grown. To well enjoy the fuchsia you must annually grow a young batch, not only because vigorous and free-grown young plants flower much longer in the conservatory than those of mature age, but because there are usually annual additions of new and desirable kinds. Fuchsias may be grown six feet high, well furnished, handsome pyramids, in twelve months from the time of striking, or even in much less time in the hands of a good cultivator, so that nobody who is not provided need have to wait long for a stock of them. As a subject for planting out in the conservatory, wherever there are beds of earth and pillars, it is about the best thing that can be employed, the profusion of bloom afforded by a fuchsia planted out in a rich bed in a conservatory, and trained up a pillar or even against a back wall, being surprising as compared with that seen on pot specimens. But where the climate admits of the fuchsia being well and freely grown in the open air, there it should obtain more attention than usual. In the south of England and Ireland, and in many mild places on our coasts, it grows beautifully in the open air, and a large bush is one of the prettiest

sights in a garden, especially the old *F. globosa*, which makes such sturdy bushes as to become quite a full-sized shrub in some parts of these islands, living through the winter without losing a twig in ordinary seasons. Even in places where their overground development may not thus survive, they may be grown as herbaceous plants, cut down every year, and covered with a little coal ashes or some such material; though it must be confessed that unless the situation be mild there is not much to be gained by growing them in the open air. Sometimes, however, they may be well done by being matted up during winter even in cold situations, so that tall bushy specimens were obtained for summer blooming, to be again put under their little thatched pyramid in autumn. They grow freely and nearly all through the winter in Orkney. But as house plants everybody may enjoy them, and for this purpose is offered the following selection of the best sorts of the various colours :—

Scarlet Sepals and Single Dark Corolla.—Light Heart, Lizzie Hexham, Aurora, Charming, La Favorita, Lord Elcho, Enoch Arden, Victor Emmanuel, Fame, Bacchus, La Traviata, Lucrezia Borgia, Little Bo-peep.

Scarlet Sepals and Single Rose or Lavender Corolla.—Roderick Dhu, Northern Light, Sunshine, Beauty, Constellation, Don Giovanni, Rifleman, Ben-e-Gloe, Dr. Livingstone.

White Sepals and Single Purple Corolla.—Prince Alfred, Lady Heytesbury.

White Sepals and Single Scarlet or Pink Corolla.—Rose of Denmark, Lucy Mills, Catherine Parr, Arabella, Agnes, Minnie Banks, Bianca marginata, Il Trovatore, Merry Maid.

Scarlet Sepals with Single White Corolla.—Conspicua, Puritana, Mrs. Gladstone, Bland's Floribunda, Queen of the Whites.

Scarlet Sepals and Double White Corolla.—Emperor of Fuchsias, Eva, Vainqueur de Puebla.

Scarlet Sepals and Double Dark Purple or Blue Corolla.—Grand Duke, Rifleman, Blue Beauty, Agamemnon, King of the Doubles, Norfolk Giant (or Norfolk Hero), Grand Admiral, Alberta, Monster.

Mignonette for winter blooming.—All amateurs would like to have this simple flower in perfection through the winter months, and yet all but the very few fail to have plants blooming at that season. Some nurse the plants to death, others grow them in a

temperature much too high for their wants, and some run to the other extreme and starve their plants. Now, to achieve complete success, mignonette should be sown three times, say the middle of July, the middle of August, and the first week in September. The pots must be what are called four-inch, and be quite clean. Drain them thoroughly with rough bones, fill with a compost of fresh turfy loam, and one-third of rotten dung well incorporated, and if it is dry make the soil quite firm. At the time of sowing, cover the seed with sandy loam, give a good soaking of water, and shade the pots until the plants come up. The pots should be placed in a pit or frame, not that it is necessary that they be covered with glass at all times, but so that in the event of heavy rain or boisterous storms, the plants may be protected from danger. Directly the plants are of sufficient size to handle them, turn them out, retaining not more than five of the strongest plants in each pot, and should these be at all spindly or weak, earth them with a little dry soil, and water around the sides of the pot. There is nothing that mignonette is so impatient of as stagnant moisture around the collar of the plant, and hence it is important that the drainage of the pots be effective, and the pots after the end of August be not exposed to heavy rains, and from the end of September until February not a drop of moisture should fall upon the plants. Give what water may be necessary at the roots; but later in the season do it so that they may be dry before the frame is shut up for the night. The plants first sown will be fit if properly managed to take a shift into six-inch pots by the end of August, the second lot may be repotted about the end of September; but the plants last raised need not receive larger pots until February. By the end of September the first raised plants should be strong and healthy; but unless they be wanted it will be wise to remove the flower spikes directly they can be handled; that will add materially to the size of the plant, and strengthen the bloom for the winter. Now through the winter the following rules must be observed in the management of mignonette. First, the place for the blooming plants must be cool and close to the glass; plenty of air must be given, but the plants must not be exposed to cold cutting draughts, or the foliage will soon turn sickly. Secondly, water must be carefully used, giving sufficient, but not making the plants sodden; and thirdly, the temperature of the house should not exceed, by fire-heat, 40° to 45° . Succession plants are the best kept in pits or frames. Plunge

the pots into cinder ashes, water very cautiously, and give all the air possible without exposing the plants to rain. On any mild days the sashes may be taken entirely off with decided advantage. Protect from frost on cold nights and your success in growing mignonette will not be called in question. If the last sown batch receive a shift in February they may be grown into very large specimens. A good pot of mignonette in the spring should be from twelve to twenty inches or more high, and a bush quite as much in diameter. Weak guano water may be used with decided advantage when they are in free growth.

Garden Enemies.

Birds.—The garden thrush is very apt to attack gooseberries, currants, and raspberries, towards the end of this month, particularly if the weather chances to be dry, as in that case slugs and snails are not abundant. It has been observed also, that caterpillars and various kinds of grubs are not so abundant in July as they are both before and after; and hence several birds feed upon fruit at this season, though they usually prefer animal food. The missel thrush will often be found in this month eating red currants, which it generally prefers to the white ones, and smooth yellow gooseberries, which are mostly eaten by the birds before the rough red ones. Garden peas are often attacked by house sparrows; but the larger birds do not disdain to partake of them occasionally, particularly the blackbird and thrush; the blackbird being always conspicuous from its yellow beak and jet black feathers, and the missel thrush by the spots on its breast. In July scarcely any birds sing; so that in this month and August, the groves are more silent than in any other month in the year.

Insects.—One of the most destructive insects at this season is the *raspberry beetle* (*Dermestes*, or *Byturus tomentosus*). "Many of the raspberries," says Mr. Westwood, "may now be perceived more or less shrivelled, with the seed vessels dried up." These berries are not half the size of the others, as may be seen in fig. 62, in which *a* is a full-grown raspberry, and *b* one that has been attacked by the insect. "If one of these be opened, the central core of the fruit will be found more or less burrowed (as shown at *c*), as well as the fruit itself, the seeds of which are left bare and dry, especially at the top, the remainder not being full-sized, and

being generally prematurely ripe and discoloured. This is done by a whitish grub (*d*), of about a quarter of an inch long, and rather cylindric in figure; with the under side of the body and sides, and articulations of the segments, dirty white; the head and a dorsal plate on each ring brownish buff, with the sides and a central

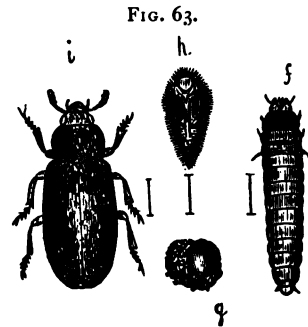
FIG. 62.



A branch of the Raspberry, attacked by the Raspberry Beetle.

longitudinal line on each plate brown, thus giving the appearance of three dorsal lines of brown. The head is horny, and furnished with horny jaws and short feelers, as well as with the various membranous parts usually present, composing the under portions of the mouth of the larvæ of Coleoptera. The grub is also furnished with six short, scaly, articulated feet. It has also two short scaly

horns on the upper side of the extremity of the body, the under side being furnished with a fleshy retractile tubercle, which the insect uses as a seventh foot. When full grown it descends to the earth, where it buries itself to a considerable depth, forming for itself a small oval cocoon of earth, with the inner surface quite smooth. Here it assumes the ordinary pupa state to which all coleopterous insects are subject." The perfect insect is a small, buff or slaty-brown, oval beetle, about one-sixth of an inch long, with knobbed antennæ (*e*), which is seen flying about the raspberry plants in summer, and is sometimes also found on the hawthorn and blackberry. In fig. 63, *f* is the larva magnified, and *g* the cocoon of earth, open at one end: *h* is the pupa seen on the under side, and *i* the perfect insect, both magnified; the lines showing the natural length of each.

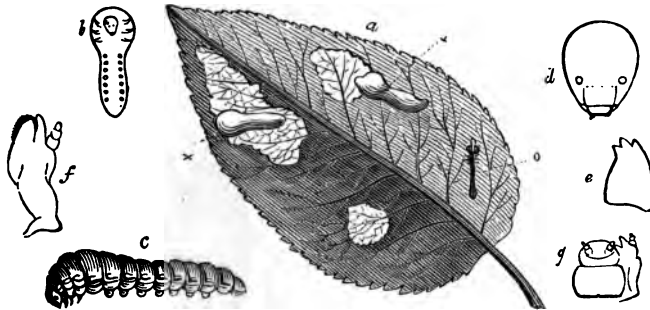


The Raspberry Beetle in its various states.

In this month the leaves of cherry, pear, quince, and plum trees are often infested with a very singular kind of insect, which resembles a small black slug, and which is covered with a slimy secretion, which has a most disagreeable and sickening appearance. These insects feed only on the upper surface of the leaves, as shown at *a* in fig. 64, which they entirely destroy, leaving the under part untouched, so that the leaf is left entire, though it appears as blighted and shrivelled as if it had been scorched by lightning; and in the course of a few weeks the leaves drop off, as though winter had come upon them prematurely. When feeding, the front of the body of this grub is inflated (as shown at *b*), and the hinder segments narrowed, so that the insect somewhat resembles a minute tadpole, or rather the excrement of a sparrow or a swallow, or a drop of black paint, which appears to have accidentally fallen upon the leaf; but on taking off its slimy covering a fleshy caterpillar will be discovered, as shown, greatly magnified, at *c* in fig. 64. The head of the larva, seen in front, is shown at *d*, and *e* is one of the mandibles: one of the lower jaws is shown at *f*, and the lower lip at *g*. The insect remains during

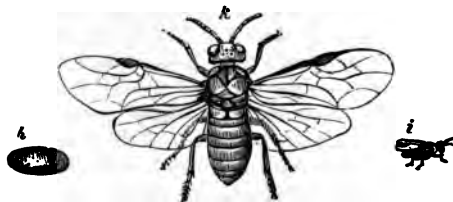
the day perfectly quiet, with its head drawn inwards, so as to be completely hidden, but at night it crawls slowly about from branch to branch. It changes its skin two or three times, leaving its former covering (o) attached to the leaves, on which it appears

FIG. 64.

*Details of the Slimy Grub of the Pear Tree.*

like a short piece of black thread, with a knot at one end, the knot being generally shining. These exuviae may often be seen on the leaves of various fruit trees, and on those of the hawthorn, in the month of July, at the latter end of which month, or the

FIG. 65.

*The perfect insect and cocoon of the Slimy Grub of the Pear Tree.*

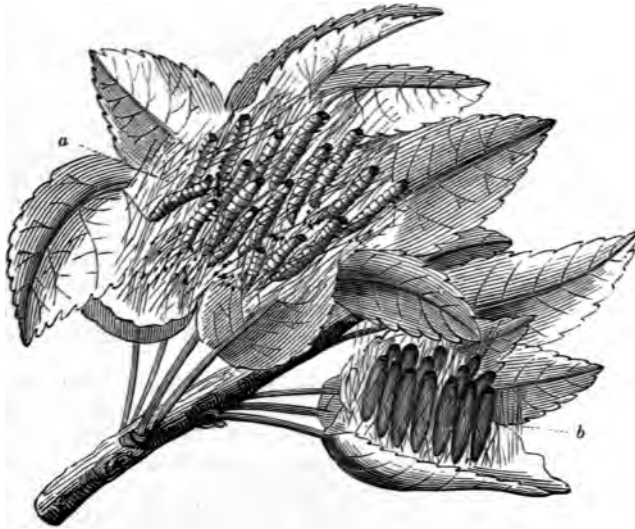
beginning of August, the insects enclose themselves in cocoons, like that shown at *h* in fig. 65. When they first change their skin, they are of a clayey colour, and destitute of slime, and at this time they will occasionally bend their bodies so as to make the

head and tail meet. In a few days, however, the slime appears, and the insect resumes its previous habits. When about to enter into the cocoon state, the movements of the animal become extremely sluggish, and it crawls to the under side of the leaf; the cocoon is brown, and covered externally with small particles of earth, which are fastened together with silken threads. The insect was described by Linnæus as the Saw-fly of the Cherry, and he called it *Tenthredo cerasi*, as he conceived that its ravages were confined to the cherry. Modern entomologists, however, finding that it attacks several plants, and that it differs from the common Saw-flies, have changed its name to *Selandria æthiops*. In fig. 65, *i* represents the perfect insect of its natural size, and *k* shows it greatly magnified. It is extremely difficult to destroy these insects. Mr. Major recommends dusting the trees, when dry, with quicklime; but Mr. Fox of Little Dalby Hall, Leicestershire, who sent some leaves of a pear-tree covered with the larvæ of these insects to the *Gardener's Magazine*, mentions that dusting the insects with quicklime had no other effect upon them than to make them cast off their outer skin, and assume the yellow clay-like appearance above mentioned. "In four hours after the operation," he continues, "they had fixed themselves to another part of the leaves as firmly as if nothing had been done to them." Mr. Westwood, however, thinks that this result was only owing to the insect being then just about to change its skin, and that the effect of the lime would have been quite different at any other period.

Another mode of destroying this insect is as follows:—"To thirty gallons of water, add a peck of quicklime, and after standing a few hours pour it gently off to prevent any of the sediment mixing with the liquid, and add two pounds of soft soap, with which one pound of sulphur has been well mixed previously to putting it in the water; then add two gallons of a decoction of artichoke leaves, and one gallon of tobacco liquor. The ingredients should be well mixed together, and then kept for use. When the mixture is to be used, it should be in the proportion of one-third to two-thirds of pure water, and it should be applied with a garden engine, from three to seven o'clock in the evening, after a fine dry day, or between five and eight in the morning, if no dew has fallen the previous evening. From two to six washings will be found sufficient to clean the trees; and if the mixture be used on those trees that are not infested, it will be found a great means of preventing them

from becoming so. To make the decoction of artichoke leaves, take twenty-eight pounds of leaves, and boil them in twelve gallons of water for half an hour. Then strain off the liquid, and, letting it stand till cold, barrel it, to be used as wanted. This decoction of artichoke leaves will be found very useful to wash infested trees with, as in many cases it will destroy the insects alone. An infusion of elder leaves, formed by pouring boiling water upon them, is also a very useful thing to wash trees with, as it will destroy many insects, particularly when they are first hatched."

FIG. 66.



A branch attacked by the Larvæ and Pupæ of the Small Ermine Moth.

Another very destructive insect which attacks the leaves of fruit and other trees about this season is the caterpillar of the *small ermine moth* (*Yponomeuta padella*). The apple, the hawthorn, and the bird-cherry are particularly subject to the attacks of this insect, and in the month of July they may be seen completely covered with webs, which hang suspended from their branches in festoons, sometimes reaching the ground, and even spreading over the earth be-

neath the tree. It is peculiar in this insect that it is found in numbers together, not only in its caterpillar but in its pupa state, the caterpillars feeding together under the shelter of a web, as shown at *a* in fig. 66, and the cocoons being formed under the shelter of a similar web, as shown at *b*. The webs under which the caterpillars feed, Mr. Westwood informs us, "are quitted from time to time, and new encampments established at short distances from each other: hence each brood constructs several webs in the course of its caterpillar state; the reason of which is, that the caterpillars do not quit their webs to feed, but only eat such leaves as are enclosed in each web. The number of inhabitants in a colony varies from one hundred to two hundred; and hence the more numerous the colony the more frequently is a change of residence required. These webs consist of a great number of threads, not unlike spiders' webs, arranged somewhat irregularly, but sufficiently loose to enable the inhabitants to be seen through the covering. The caterpillars eat only the parenchyma of the upper side of the leaf; they also arrange their threads longitudinally, each apparently having a thread of its own, along which it moves, either backwards or forwards, without disturbing its neighbours, which when in repose are arranged side by side. The larger-sized nets include several of the smaller branches or twigs, with their leaves; and some parts are of a firmer texture than the rest, apparently for resisting the wet. When the parenchyma of the upper sides of the leaves enclosed in the web has been consumed, the nest is abandoned and a new one made, enclosing a fresh bunch of twigs, each of the caterpillars spinning a considerable number of threads; and thus each colony constructs as many as six or eight distinct webs, disfiguring the tree, especially when, as is often the case, there are many societies established upon it. The leaves thus half consumed wither up, as well as the young branches, for want of support, and the tree assumes the appearance of having been entirely scorched up with fire. The caterpillars rarely quit their nests; but when alarmed or disturbed, they endeavour to make their escape by spinning a long thread, and dropping to the ground. When touched also they writhe about with great activity, and will run backwards nearly as fast as forwards. When full-grown, as shown at *g* in fig. 67, about the beginning of July, each caterpillar encloses itself in a long and nearly cylindrical cocoon of white silk (*d*), of a leathery consistence; and these cocoons are arranged side by side at one end of the nest, form-

ing a mass not unlike, only considerably larger than, a mass of ant's eggs, as the cocoons of the ants are commonly called. As the whole of a colony has been reared from one brood of eggs, it is generally the case that the entire number commence the construction of their cocoons at the same time, and the whole are generally completed in the same day. In this cocoon the insect immediately undergoes its change to the chrysalis state (*c* in fig. 67); and its chrysalis, which does not materially differ from those of other small lepidopterous insects, is of a shining chestnut colour. It differs, however, from the chrysalides of the leaf-rollers, in wanting the transverse series of hooks with which the abdominal segments of the latter chrysalides are furnished; and hence, when at the expiration of about twenty days the perfect insect is ready to come forth, the insect being unable to work the chrysalis out of the

FIG. 67.

*The Small Ermine Moth in its different states.*

cocoon, the escape of the imago is effected within the latter, and the moth (*f*), with its wings in an unexpanded state, makes its way out of one end of the cocoon, after which its wings soon spread to their full size, as shown at *e*." The perfect insects are very conspicuous from their ermine-like wings, and they appear in great abundance. When the female lays her eggs, she coats them over with a gummy matter, which, when dry, forms a thin shell or scale, about the eighth of an inch in diameter. Under this scale the eggs are hatched in autumn, though the young caterpillars do not emerge from their covering till the following spring. On examining one of these scales about the middle of October, twenty-six living caterpillars were found under it, though the edges of the scale were fast cemented to the branch. When the caterpillars first emerge from their birthplace in spring, "they do not commence spinning webs immediately; they cannot yet eat the epidermis of the leaves,

and they require some protection from the cold and rain, which tender frames are not yet fitted to endure; to effect this, they mine into the leaves, eating the cellular tissue only, and leaving the epidermis untouched. Having acquired sufficient strength to withstand the vicissitudes of the atmosphere, and to devour the epidermis of the leaves, they make their way out; and the anxious gardener, who has hitherto only observed the brownness of the leaves caused by the mining, but which is by him attributed to the withering blast of an easterly wind, is astonished when he perceives myriads of caterpillars swarming on his trees, and proceeding with alarming rapidity in their devastating course. The fact of their mining sufficiently explains the reason of their sudden appearance: it shows how one day not a single caterpillar may be visible on the trees, and the next they may be swarming with larvæ, of so large a size as to rebut the idea of their having been recently hatched." Hand-picking is the only way of destroying these insects.

Another very destructive insect at this season is a small *weevil* (*Curculio contractus*, Marsh), the egg of which is laid in the root of the cabbage, just at the base of the stem, when the plant is quite young, and produces a swelling, which is called by gardeners the club. If this swelling be opened, it will be found to contain a small white maggot, and if this be removed and the cabbage replanted, no serious injury will be done; but if the insect be suffered to remain, the grub feeds upon the woody part of the stem, and forms a tumour, which increases till it is as large as a common hen's egg, with a rugged surface, and a most unpleasant smell. The fibrous roots of the cabbage become thickened and distorted, and hence, in some places, the disease is called fingers and toes, from the grotesque forms the roots assume. It may easily be imagined that this unnatural increase of the roots draws all the nourishment away from the cabbage, and, in fact, the plants which have been attacked become stunted, and dwindle away instead of forming a head. This disease is sometimes called ambury or hanbury, and it attacks the turnip as well as the cabbage. The perfect insect is a very small beetle, of a dingy black, with its breast spotted with white, and it undergoes its transformations in the ground, emerging from it just about the time when the cabbages are in the seed-bed, and the young plants are just in a state to become a repository for the eggs.

Towards the end of this month plums, peaches, and nectarines

are much infested by *earwigs*; that insect, notwithstanding the vulgar prejudices against it, feeding entirely on vegetables. Though the earwig is so common, till lately its history was only imperfectly understood; and even now many persons are not aware that it has wings carefully folded under its shining wing-cases, and also that it is the only insect which takes care of its young. All other insects die as soon as they have laid their eggs, but the earwig broods over its young as a hen does over her chickens, and collects them with great care when they are scattered about. The young ones differ from their parents principally in outward appearance, in being much smaller, and, when first hatched, nearly white; but when examined closely they will be found to have neither wings nor wing-cases, and

FIG. 68.

*A Trap for catching Earwigs.*

their forceps is much more straight. In the pupa state they are quite active, and have wings and wing-cases; but they are concealed by flat scales or sheaths on the back. The difference, however, in the general appearance of the pupa, the larva, and the perfect insect is so slight, that no one but an entomologist would know them asunder, and they are destructive in all their states. As these insects are particularly fond of creeping into sheltered places, and especially into hollow tubes, one of the best plans for destroying them is to sew together a number of hollow reeds, such as those of the Italian reed (*Arundo Donax*), dry rhubarb or bean-stalks, or any other hollow stalks of vegetables, and to hang them up on the walls near the fruit that is likely to be attacked. Sometimes tin

tubes are soldered together for this purpose, as shown in fig. 68 ; or tubes of any kind of thin wood may be fastened together in the same manner. As the earwigs feed during the night, and creep into these tubes early in the morning, the morning is the time to examine them, when they will be found full of earwigs. When the tin tubes are used, a little hay, but not more than half enough to fill the tube, is put in to afford the insect a more comfortable shelter.

Ants are very troublesome in gardens, both at this and other seasons, and amateurs are constantly inquiring as to the best way of getting rid of them. In a greenhouse or stove they are not difficult to exterminate, by putting a number of half picked bones in the spots where they resort, and when these are black with ants quickly putting them into a bucket of scalding water, and repeating the operation.

Another good remedy is to obtain pieces of large and coarse table sponge ; dip them in treacle and water, place them on tiles or old dishes where the ants abound, and when they are black with ants, throw them into boiling water, afterwards washing them out, and renewing the process till the colony is destroyed.

Some say that they have got rid of these pests, even in the open garden, by simply scattering a few drops of paraffin near their nests. A sprinkling of guano over the surface of ground they inhabit, is said to be obnoxious to them. There can be no doubt of the success of the sponge or bone operations in any structure infested by ants ; out of doors it will perhaps be more difficult to get at the nests and destroy them with scalding water. Some have induced them to build up their nests under inverted flower-pots, having the hole covered with a bit of turf, and then conveyed away nest and all ; but it is not always easy to get at the nest, or desirable to disturb the ground. When this is the case, it is best to try a sprinkling of paraffin.

AUGUST.

General Observations and Directions.

The Weather, &c.—The month of August is generally very hot and dry, and consequently, there is frequently a great deal of electricity in the atmosphere, which shows itself in thunderstorms and meteors.

Open Garden.—Frequently at this season lawns become very brown if not well watered. Watering them by means of manual labour is worse than useless. Wherever it is possible the hose should be brought to bear on them, and the turf thoroughly saturated portion by portion. In the flower garden the preservation of neatness and good keeping in every department is the main work at present, when every one is enjoying the garden—regular dwellers in the country and those who evacuate their town houses at this season. In the winter and spring we may tolerate a little untidiness, particularly if extensive planting or other work is going on, but not now. Propagation must be actively carried on. As the verbenas is often a very uncertain subject to keep through the winter, at least in the hands of amateurs, it is a good plan to take up a few plants of the kinds desired to propagate from, pot them and shade for a few days, and then turn out to harden before winter comes on. Of course those who succeed with young plants have no need of this advice. Old plants when kept over the winter in a healthy state yield plenty of cuttings in spring, when they strike as readily as willow twigs.

Some things in the flower garden may be slightly disfigured by the presence of decayed bloom, &c., and if time can be spared to remove such eyesores it would be an improvement. It is work that may be done by a boy, but he should be instructed to do it carefully and without pulling, so as not to disturb the plants, which in some kinds are but very delicately rooted. At the same time it

may be advantageous to prevent some things from seeding, and thereby prolong their bloom and beauty. The freshness of many subjects, from fuchsias to delphiniums, may be a good deal preserved in this way. Roses may be budded all through this month with success, and, as the perpetuals are flowering freely, it is desirable to remove decayed blooms, &c., so that the beauty of the fresh opening blooms may not be detracted from. Hollyhocks are now in full beauty, and should be tied and staked; they may in some soils require plenty of water—certainly so if the amateur intends to exhibit them.

Seeds of biennials should be sown now; and as many of them are very showy and pretty, they are worthy of more attention than they usually receive. We particularly allude to such things as the bright rose *Silene pendula*, the Canterbury bell, *Centaurea cyanus*, and the wood forget-me-not; while the bedding-out pansies, so much used for spring gardening of late years, may now be propagated with facility by cuttings. Towards the end of the month is a good time to sow seeds of the many annual plants that flower so well in the spring months. These are worthy of much attention, from the fact that they may be cleared away with facility and without remorse, as soon as it is desirable to plant out the summer flowers. To the class belong such things as *Saponaria calabrica*, *Limnanthes*, *Erysimum*, *Lasthenia*, *Collinsia*. The propagation of some perennial things used in this way, such as pansies, daisies, &c., may also be carried on now with facility.

It is about the best time of the year to visit famous gardens, one of the best ways of improving our knowledge of the art of gardening. The training of espalier, cordon, and other fruit trees will require attention just now, and all useless wood that might retard sunlight from that which is to remain must be removed. It will now be occasionally necessary to cut in pretty closely the late shoots that form upon fruit trees. As regards the length to leave such shoots, two inches from their base may be adopted as a general rule. On walls every shoot should be carefully nailed in now, and in no one place should the shoots be overcrowded, as that would prevent the best from enjoying all the sun possible.

Insect vermin are likely to pay great attention to fruit and fruit tree foliage during the present month, and must be sharply looked after. Wasps must be exterminated, or they may do much damage. Red spider does more damage than any in the end, in consequence

of destroying the health of the foliage or lungs of the peach, or any other plant it may infest. Syringing is a good remedy, but not the poor inefficient syringings which are generally given. Usually not one-fourth the necessary amount of water is supplied; often a few marks on the brown and dusty foliage indicate how poorly the syringer has done his work. But to exterminate red spider and keep the leaves in a beautiful green and glossy condition, it is necessary that a dense, strong, but gentle stream from the water engine should rush over the surface of every leaf, and sweep away red spider and every other impurity. We say the engine, because labour with the best of syringes is so tedious and so awkward. They are only fitted for sprinkling budding plants in spring, seedlings, and things of that description. Wherever peaches have to be grown, either indoors or out, there should be an effective garden engine. Every peach wall should be syringed both ways on the same day. This is all the more necessary in dry districts, but even in moist and genial ones it will be beneficial. It is worthy of note that sulphur is an efficient destroyer of red spider, and that the famous peach-growers of Montreuil use that only, and not the syringe.

The gathering of fruit will now occupy some attention, and it requires a good deal more nicety than is generally supposed. It should never be pressed with the finger to ascertain if it is ripe, as such pressures will become decayed when the fruit is stored. The best way to ascertain if a fruit is ripe is to lay the hand gently under it and raise it upwards a little, when, if ripe, the stalk will part from the stem. All choice and good fruit should be handled as carefully as fresh eggs, and carried in shallow and convenient baskets to the fruit room. This structure, or that which answers for it, should be prepared for the fruit harvest at once. Strawberry plantations may be made from runners potted during July and the early part of August. Potatoes that are casting their haulms should be taken up and stored. Advanced crops of celery and leeks should be earthed up. Strawberries may be planted, mushroom beds made, and late peas thoroughly watered. Many herbs will now be ready for drying. Onions should be taken up and dried in an airy place as soon as the stalks begin to wither.

The principal autumn sowings of cabbage should now be made, choosing such varieties as the Fulham Early York, Early Rattersea, Schilling's Queen, and also a pinch of the red variety, and cauli-

flowers towards the end of the month. Sow also a late crop of endive, some Early Horn carrots on a warm border for use in spring, and the main crop of winter spinach in rich light ground. It should be particularly noted that the Flanders spinach is the best for the winter. It is a round-seeded kind, unlike the common winter one, and the main crop of it should be sown rather thinly on light soil and in a dry situation. Make also sowings of eatable turnips, such as the Orange Jelly and White Stone; for these also nice light rich soil is desirable. In some stiff cold soils it is nearly useless to sow them, as they do no good. Sow also small salads if you care for them, and black radishes. For all these crops the time for sowing may vary with circumstances, soil, and climate, all of which must be judged of by the sagacious cultivator. Plant out on a warm border the lettuces sown last month, also endive, and lettuces from previous sowings should be tied up with bass mat as soon as ready for blanching. On warm soils in mild parts it is not too late yet to sow Tripoli onion. Celery should be earthed up in dry weather only. Mushroom beds should now be made in succession. The bulb catalogues come out during this month, and should be examined for the best and cheapest hardy species, as these add a marvellous beauty to the garden in spring, and should be seen in every garden.

Indoor Department.—In keeping up a display of bloom in the conservatory at this season it will be found an advantage to have a good supply of well-grown annuals in pots, and in a conservatory of any pretensions there will be found many places for which such plants are well adapted. Early forced Indian azaleas will now have set their buds, and if they have been pretty well exposed the wood will be ripened, and they may be removed to the house at the end of the month. The early camellias should also be housed. Heaths that have been cut in after flowering should be kept rather close, and shaded when necessary till growth commences, when they should be freely exposed with the general stock. Deutzias, Persian lilacs, &c., for forcing should be fully exposed to the sun so as to ripen the flower buds. Do not forget to give chrysanthemums a liberal supply of diluted liquid manure, to let them have plenty of room, and to apply sulphur for mildew in case it should appear. Young vines should have every encouragement to make firm and well-ripened wood; plenty of air early in the day; the house to be

shut up and sprinkled early in the afternoon. Take care that red spider does not get hold of the foliage. Late vines should be assisted with a little fire heat, all superfluous growth stopped, and should have abundance of ventilation given. Wherever wasps are troublesome, the elastic hexagon netting should be fastened over the ventilators, and broad tape used round the edges to assist in fastening it the more securely and conveniently. The foliage of all indoor fruits should be kept in a healthy state as long as possible; it is desirable to ripen the wood thoroughly, but the premature discoloration of the leaves from minute vermin or like causes must not be mistaken for "ripening." A good supply of fermenting materials should be kept in a regular course of preparation, for forming new beds and keeping up the heat of the linings to late cucumber and melon frames. Materials should also be prepared for successional beds of mushrooms; if any are ready they should be spawned at once. Do not let the beds want for water, and whenever necessary give a good soaking, so as not to be always dribbling, as such only tends to rot off the young mushrooms. The propagation of bedding plants should now be carried on with all possible despatch.

Things not to be done in August.

Never allow tomatoes to form quantities of young fruit, as is their wont, but when a sufficient crop is set, or when all are set that you think the season capable of ripening, pinch off all the others, thus throwing the strength of the plants into the large fruits.

Never place strawberries in pots in a shady position, but keep them on a hard bottom in the full sun, never suffering them to want for water.

Never allow wasps to destroy your grapes or any other fruit grown indoors, but nail elastic hexagon netting over the ventilators so that they cannot enter.

Never allow red spider to make way on the leaves of indoor peaches or vines at this season; if any trace of the pest is discovered, keep it in check by copious syringings with the garden engine.

Do not earth up celery except what you wish to use early; an inch or two of loose earth placed in the bottom of the trench after

a thorough watering will prevent evaporation and do good, but in other respects the general crops are better as yet left alone.

Never allow the plants in the flower beds to encroach upon the grass plot or box edging: prune and peg them down so as to keep them within the compass of the beds; as unless this is done the shape of the beds will become indistinct, and the form of the garden, particularly if it be a geometrical one, will be destroyed.

Never save seeds of annuals but from the very best flowers; and bear in mind that quality should take the precedence of quantity in everything relative to a garden.

Do not disfigure the flower beds in procuring cuttings of bedding plants. It is quite possible to get abundance of cuttings by judiciously thinning and stopping the plants, and the calceolaria beds need not be mutilated, as these plants strike better in October.

Principal Operations in August.

Making and managing the Mushroom Bed.—Towards the end of August the amateur should think of making his mushroom bed. Mushrooms may be grown either in houses set apart for them, or in a shed at the back of a hothouse or greenhouse, or in any empty outhouse or cellar. If they are grown in a shed, it must be in some place where the temperature does not fall below 45° , or rise above 70° . The mushroom bed may be made according to the following directions. Take a quantity of fresh manure, with the longest of the straw shaken out, from a stable where the horses are fed on hay and corn, but not on green food. Mix a little light soil with the manure, and then spread it on the floor of the shed about four inches deep. Add to it as opportunity occurs, keeping the whole in a state of quiet fermentation, and turning the mass over to prevent it heating too rapidly. After a few turnings, and when the manure is slightly decomposed, and in what gardeners call a "sweet" condition, the bed is made by firmly pressing the manure into the shape required. Some make the beds flat and on the ground, or on shelves, others make them ridge-shaped, say three feet wide at the base, and sloping to a point. For the amateur the flat bed is the best and the easiest to manage. To ascertain the degree of heat, put two or three sharp-pointed

sticks into the bed, and when, upon being drawn out, they feel about milk-warm, or between 80° and 90°, it is time to put in the mushroom spawn. Observe, however, that when this operation is performed, the heat should be rather on the decline than on the increase. Having procured some spawn, break it into pieces about the size of a hen's egg. Place the pieces all over the bed, about a foot apart, and two inches below the surface. Beat the whole down hard. Be careful not to let the heat increase above the degree mentioned, otherwise the spawn will be destroyed, and the bed must be stocked again with fresh spawn. Indeed, for security's sake, it is always best to repeat the spawning when the heat is on the decline. After all danger of increased heat is past, cover the bed with light soil about two inches deep, then beat it down hard. Mushrooms always do best in a firm hard soil: however hard, they will find their way through it. They have even been known to raise the pavement of a cellar floor. However, there is no need for any extraordinary beating or pressing. The steel fork for the manure, and the spade or shovel for the covering of soil, will be quite enough. Examine the sticks which were originally placed in the bed; if they are lukewarm, all is right. A few days afterwards, cover the bed with hay or straw; but if it increases the heat, remove it for a time. If the place is warm and dark, this covering may be dispensed with. In five or six weeks the mushrooms ought to appear. A gentle watering now and then will hasten their growth; but too much will cause the spawn to rot, and then of course the bed will be unproductive, whereas it ought to produce for five or six weeks or more. The covering keeps the soil moist, especially when much exposed to the air.

Winter Spinach and Winter Turnips.—There is no work more important just now in the kitchen garden than that of insuring good seed beds of the above-named vegetables, for they come into use in the spring at that critical period when winter greens are used up, and not a leaf of any summer vegetable can be appropriated as food. It requires good practice and good judgment to do well with winter spinach and winter turnips. If they are not fairly treated as to the preparation of the soil, a miserable result must ensue. And of equal importance is it to sow the seed at the proper time, for if sown too early the crop is likely to be in a forward succulent state when severe frost occurs, and great havoc will be committed by it amongst the 'winter proud' vegetation. On

the other hand, if sown too late, the plants attain no size before the growing season is over, and so never have a place in the world at all, but after a brief and poor existence dwindle miserably away. There is one thing as certain as life and death, and that is that no *general date* can be given for the sowing of these useful esculents. On the cold clays on the north side of London, the seeds must be sown and there must be a visible plant by the middle of August to give an average prospect of success, though of course late sown seed will now and then turn out well in the event of a warm autumn and a mild winter. But on the warm and dry sandy soils south and west of London, though only a few miles distant from the districts just referred to, the sowing of these seeds may take place a full month later, with the same average certainty of a profitable result. Taking the farms and gardens generally in all parts of the country, we may say that the latest sowings of these things should take place between the 10th of August and the 10th of September.

In preparing the ground for these crops, deep digging is of the utmost importance, and it is better to put on a fair dressing of good manure than to trust to a soil that has been hard cropped all the summer, and for some time unassisted with any fertilizer. But if the ground is in good heart, manure should not be used, for a rank state of the ground causes turnips to rot at the core at the very moment when they are most wanted at the turn of the spring. The turnip-fly never touches late sown turnips, but this crop, in common with winter spinach, is exposed to the attacks of that beastly pest the larva of the Daddy Longlegs, a dark, legless, sausage-like grub that no poison touches, and nothing less than the bill of a bird or the heel of a foot can destroy. We have many a time seen as fine beds of winter spinach as ever had place in a garden entirely destroyed during mild weather towards the end of the year by this grub, which attacks the plant at the collar (*i.e.*, the portion between the leaves and roots), and can only be eradicated by searching for it in detail, with the aid of a hand-fork or trowel to scratch the surface soil—a task which only some half-dozen persons in the land can find time or patience to carry out. The turnip suffers in the same way just as it is beginning to form the bulb. It is then eaten through at the neck, and the head falls over, the leaves become rags, and there is an end of it. Young birds abound just now; rooks, robins, thrushes, and blackbirds are hungry; give them all a chance of picking the young grubs out of

the soil by at once deep-digging the plots intended to be sown, and leaving them a few days in a quite rough condition. A piece of land where not one plant would escape if the seed were sown on the same day as the ground was made ready, or even the next day, would bring the whole crop to perfection if left after digging to be searched by the birds for three or four days before sowing the seed. A second digging will of course do it no harm, and then it should be broken down and made tolerably fine for sowing. Broadcasting is a barbarous practice, and ought never to be tolerated in gardens. Adopt the row system, and you can follow with the hoe system to some advantage, and your work will look well from first to last. Turnips must be sown at distances varying with their several degrees of robustness; if they are crowded, they never bulb well. The rows should be from twelve to eighteen inches apart, and the seed should be dropped two or three together in patches nine to twelve inches apart. These patches will of course have to be thinned to one plant each when large enough to handle. The distances for winter spinach should be one foot between the rows, and nine inches from plant to plant.

Respecting varieties, a few sorts are better than many, yet as turnips are among the most useful of all vegetables, it is advisable to sow several sorts at this time of year, for if it comes to the worst with a glut, you can bury them at the bottoms of trenches when sowing spring seeds, and every cartload so disposed of will be as valuable for manure as one-third of a cartload of stable dung. I think I may venture to say that the very best of all turnips for sowing now is the Chirk Castle Black Stone, a very hardy sort, black outside, but snow white within, and of excellent flavour. The American Red Top Stone is a very handsome bulb, always attractive on the exhibition table, and is at once profitable in the field and acceptable on the table. The Early Yellow Dutch, or as it is called in some catalogues Maltese, is a capital sort, and will be found good when other kinds have become spongy or are bolting to seed. Lastly, the Yellow Stone is hardy, comes to a good size on rather poor ground, and is as good as any turnip grown when made to smile upon a smoking leg of mutton. Practical men have their favourite sorts, and I know too well the value of adapting our selections to our localities, climates, soils, &c., to care to interfere with decisions which have been constantly confirmed by experience. But I would advise all our readers who grow winter turnips to try

the above-named sorts in addition to any other kinds that may be in favour with them, even if they have room for only a row or two of each: it is so likely that one or other of them may prove of great service, and be an acquisition for future operations. We have lately sown large breadths of Jersey Navet, which is a pretty oblong white turnip; and Green-top Six Weeks, which is one of the best flavoured turnips known. The only reason we have not included them in the above selection is that in former seasons they have not done well on our cold soil, and it is our custom to recommend things we know of by the tests of touch, eyesight, taste, and breeches pocket.

Respecting spinach, the common Prickly is a first-rate sort for winter. But, strange to say, there are very few growers who know which are the best varieties to use at the several seasons of the year. For the present sowings, the Prickly seeded sort will serve admirably; but those who can get the real Flanders spinach, which is less prickly than the other, but not as smooth as the Round-seeded, will do well to sow an equal breadth of it with the Prickly. It has broader leaves, with less prominent lobes at the base than the Prickly; and as soon as it begins to grow in spring becomes fat, and when cooked has that peculiar combination of sootiness and butteriness which gives so much delight to a real spinaceophagist. But where to get real Flanders we do not know. We lately sent to Messrs. Carter of High Holborn, and Messrs. Sutton of Reading, for samples of all the varieties of spinach they were offering in trade, but from neither did we get a sample of Flanders. Some seedsmen will tell you that Flanders and Prickly are one and the same; but that information is adapted only for the marines. But while the value of the Flanders for winter is generally unknown, the value of the Prickly for summer is equally confined to the knowledge of a few. You sow Round spinach in February, March, and April, and you do well, for it grows fast, is of succulent texture, and a favourite dish with most people; but if you sow it after April, what happens? It is no use to disguise the fact that Round-seeded spinach sown after April is thrown away, for it rushes into bloom before it has made half a dozen leaves, and becomes a wiry weed fit only to dig in as manure. But sow the Prickly sort after the end of April, choosing rich moist soil for the purpose, and in due time you will have splendid gatherings of succulent leaves; for being a slower grower, and a plant that

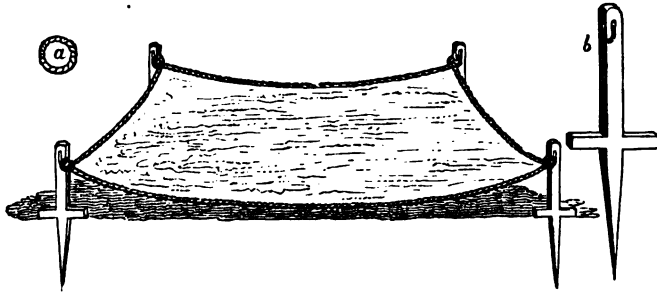
takes a firmer hold of the soil, it is very reluctant to bolt—in fact, it has very much the character of a biennial, and prefers to stand in the ground a whole winter before running to seed. Therefore every amateur should sow the Prickly spinach in summer and autumn, as well as in winter.—S. H., in *Field*.

Earthing-up Celery.—The earlier crops of celery must be earthed-up in this month, care being taken that none of the earth gets into the hearts of the plants. To prevent this, each plant may be first slightly wrapped round with a piece of matting; and to do this on a large scale, a strand is procured of great length, or is added to as it is applied; and one end being tied round and fastened to the first plant in the row, it is passed on to the next plant, giving it one twist round the leaves, and so on till the other end of the row is reached, when it is there fastened to the last plant. The moulding-up may now proceed with rapidity, and when finished the strand should be removed and applied to the row in the next trench. It is scarcely necessary to observe that where there are two rows in a trench, both must be tied up at the same time; or that when the rows are made across a broad trench, three ought to be tied, to prevent all risk of soil getting into the hearts of the third row, while the first is being earthed-up. The height of the soil applied may be three, four, or five inches, according to the height of the plants; and the earthings-up may take place at intervals of ten days or a fortnight, till by degrees the stalks are covered to the height of twelve inches for the earliest crop, and eighteen inches, or two feet, or more, for the later crops; always taking care to perform the operation when the plants are quite dry, and to keep the heart open and free, except in the last earthing before winter, when the summits of the plants may be nearly closed to exclude rain. The longer celery is allowed to grow before applying the soil, the longer time does it require to blanch; but in general three weeks or a month will effect this, more especially in the early part of the season; and there is little to be gained by earthing celery too early. The best way is to leave it till nearly or quite full grown before earthing, merely scattering an inch or two of very fine soil over the surface of the trench to prevent evaporation. This light earthing is better done after a heavy watering; and celery cannot have too much water when in a growing state. Red celery requires a longer time to blanch than white celery, and never entirely loses its red colour. The latest crop of celery which is to be in use

through the winter, will require to be protected by dry litter, or thatched hurdles, during severe frosts; or it may be taken up and preserved in sand and soil in a shed or cellar. When celery is frozen, it begins to rot immediately after the first thaw; and therefore, to prolong a crop in the open garden, protection of some sort is essential on the approach of severe frosts.

Gathering the Seeds of Culinary Vegetables.—Seeds should be gathered as soon as they are ripe, taking care to choose a dry day for the purpose, and laying the stalks which have been cut down in a dry warm place to harden before the seeds are rubbed out of the seed vessels.

FIG. 69.

*Seed Cloth.*

A seed cloth, about three or four feet wide, and ten or twelve feet long, will be found very convenient where there are a great many different kinds of seeds to be dried. The shape of the seed cloth may be as shown in fig. 69, and the edges of the cloth should be sewn to a cord on all the four sides, the loop or ring (a) being introduced at each corner. Every cloth should have four pins (b), pointed at one end, that they may enter easily into the ground, with a cross piece about a foot from the upper end, to prevent them from going in too far, and from leaning too much on one side by the tension of the cloth, and with a hook near the top on which to hang the ring or loop. It should be added, that it is seldom worth the amateur's while to save seeds, as these are usually to be obtained true to name, and of the best quality, from our seedsmen. There are, however, often cases

when it becomes desirable to save the seed of some particular crop, as it may be of a variety of peculiar excellence.

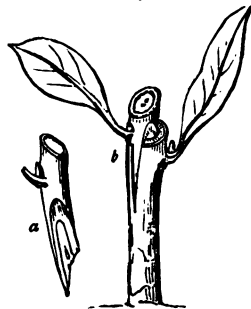
Gathering Wall Fruit.—Some of the fruit will be ripe in this month; and as fruit grown against walls is generally of a delicate texture, and has a particularly thin skin, great care should be taken to handle it as little as possible. No fruit ought ever to be taken from a wall tree unless it will leave the branch the moment it is raised up gently with the hand beneath. Some gardeners make their assistants always wear soft doeskin gloves, perfectly clean, when engaged in gathering fruit. When fruit is to be sent to any distance, it is reckoned best to pack it in small boxes to be enclosed in one large box. The fruit is wrapped up separately in either vine leaves or paper, with layers of moss between the layers of fruit; each box should be filled quite close with moss to prevent any shaking of the fruit. Cherries, currants, and other small juicy fruits are generally packed in tin boxes, alternately with layers of moss. Walnuts are generally gathered in August for pickling.

Transplanting Evergreen Shrubs.—Many gardeners recommend the transplanting of evergreen shrubs in this month, after their spring growth is completed. Great care should be taken not to dig up the plants till the holes are ready to receive them; for evergreens should not be kept out of the ground a moment longer than can be avoided, as the drying of their roots is the greatest injury they can receive. A dull day should be chosen, and the hole should be sufficiently large to allow ample space for the roots. Where it is practicable, it is considered best to transplant evergreens with a ball of earth; or, at any rate, to leave as much earth about the roots as possible. According to Mr. M'Nab, "as soon as the plant is put into its place, the earth should be filled in, leaving a sufficient hollow round the stem, and as far as the roots extend, to hold water, which should then be poured in in sufficient quantity to soak the ground down to the lowest part of the roots; in short, the whole should be made like a kind of puddle." To prevent the roots of the plant being laid bare when the water is poured upon them, Mr. M'Nab finds "the best plan is to take an old birch broom, or anything similar, and, laying it down near to the root, to cause the water to be poured upon it; this breaks the fall of the water, and prevents the roots from being washed bare of such earth as may adhere to them; and in this way time is saved, for the water may be poured out in a full stream from a pail, a water-pot, or even from a spout or pipe in

the water-cart, or barrel, where the situation is such that this can be brought up to the plant. After the first watering has dried up, the earth should be levelled round the stem of the plant, and as far out as the water has been put on, but not trodden; if the plants are large, a second watering is sometimes necessary, but in ordinary sized plants one watering is quite sufficient; and after remaining twenty-four hours, more or less, according to the nature of the soil, the earth about the stem and over the roots should be trodden as firm as possible; and after treading it should be dressed with a rake." The kinds of evergreens which are best transplanted at this season are the different kinds of rhododendrons, arbutus, and other similar plants: the holly, the laurustinus, the common and Portugal laurels. In fact, almost every kind of evergreen may now be transplanted except those belonging to the pine and fir tribe. If any evergreens were transplanted last month, care should be taken that they do not now suffer for want of water; and a thorough soaking should be given to the roots occasionally, rather than a little at a time and often. It may be added that, unless for some particular reason, there is not the slightest occasion for deranging a garden at this season for the sake of planting evergreens. August perhaps, more than any other month, is that in which people visit gardens, and generally it is better in every way to defer all planting operations till next year.

The Greffe étouffée.—Where it is wished to propagate orange trees and camellias rapidly, this is the best plan to be adopted, as it is certainly the most expeditious of all the modes of grafting. The stock must be in a growing state, and may be cut off close to a leaf which has a bud in its axil; or, as the French gardeners advise, the head of the stock may be left on. The scion must be prepared as shown at *a* in fig. 70, and the stock must be split to a depth equal to two-thirds of its thickness; the scion is then inserted as shown at *b* in fig. 70, and it is made fast with a shred of matting or worsted threads; and if the upper part of the stock was cut off, the wounded part not covered by the scion is coated over with grafting-wax.

FIG. 70.

*Greffe étouffée.*

The leaf must be left on the scion, and great care must be taken not to injure the leaf and bud left on the stock; as on these, in a great measure, depends the success of the operation. The pot containing the plant is then closely covered with a bell glass, and half-buried in a horizontal position in a bed of sand, dry tan, or dry moss, in a forcing-house or stove; the glass being stuffed round the bottom with tow or moss, so as to prevent any change of air taking place within it. After the graft has been closely covered from two to four weeks, the scion will be found perfectly united to the stock. Air is now admitted by degrees; and after a week or two more, the glass is removed altogether, the pot set upright in a gentle heat, and the upper part of the stock neatly cut off close above the scion. This mode of grafting, which is called *la greffe étouffée*, or the stifled graft, because the plants are so closely covered with a bell-glass as completely to exclude the air, is only applicable to plants of a small size growing in pots; but if this be the case, it is equally suitable to all kinds of shrubby plants, whether hardy or tender.

It is not generally desirable for amateurs or gardeners in private places to pursue any kind of grafting of indoor plants, as these are grafted in great quantities in the nurseries, where there are special means of attending to them. Operations of this kind, carried on without experience and appliances for carrying them out, usually cost more in the end than ready grown plants of the kind we desire to increase. Some, however, may pursue it for amusement sake.

The Cold Pit.—Many gardeners find this a great aid in the propagation of plants, and amateurs desiring to make the most of a very small glass department would do well to provide themselves with one, if they are not already in possession of such, as they are very useful and very economical.

The pits are simply made of sods of turf cut rather thin. Some good gardeners, indeed, skin the turf of their pasture and make the walls of their little pits with it, using merely the turf, a couple or three inches thick; and when it has acted as a wall for twelve months or more, they take it down, it being then nicely decomposed and aerated—in fact, in the best possible condition for potting. Now, whether this be the system adopted or not, it will be seen at a glance that building pits of this kind is a very cheap process. All that we want is some kind of turf, and then to have it cut neatly and made into little walls by a handy labourer. The sods may be cut from eight to ten inches wide, more or less, according to the

height we require the pit. Generally it will be well to follow the plan of a little brick pit, or even of a frame, so far as the height of the sides is concerned. Usually a rough plate of wood is placed on the top of the little sod walls, and on these the lights are placed. But a better way than that is to use nothing whatever except the wall of turf, leave the top sod with its level green side upwards, and on that rest cheap iron lights. Of course wooden ones would be apt to rot quickly in such a case.

The best possible arrangement, then, is to have little cheap iron lights, say about four and a half feet wide. These are not expensive nor very heavy, and the sooner they are turned out in quantity by some of our horticultural builders the better. However, any kind of light may be adapted to the system. I advise the iron light, convinced that these turf pits are about as useful things as we can have in the garden, and likely to be always appreciated. Some use tarpauling lights and boards and other opaque substances to cover such things; but I have no faith in such contrivances, and glass is cheap enough now to do away with the necessity of using opaque coverings in our very dull winters. The width that should be preferred for such frames, if we are about to order lights for them, would be from four to five feet—say five feet as a rule. But of course, if we have any old lights, and wish to utilize them in this way, we must make the pits precisely to suit them. The appearance of neat turf pits is in no degree more objectionable than stone ones. The proper place is an out-of-the-way nook which is generally called the melon yard, or some equivalent to that department. In all cases they should be away from the ornamental parts of a garden, as all pits and frames generally are. They should have a free, open position. Some people have a weakness for putting such things in musty corners, under trees, &c. A well drained position is of course best; and if they can be placed on one of those beds of coal ashes which often occur about a country place, so much the better.

In most cases it would be better to have the bottom lowered a little, especially if the soil beneath were of a dry nature. In some pits beds of fine earth can be placed, on which to strike cuttings in quantities. In others they will prove equally useful for storing plants in pots. In addition to bedding plants, pot roses, strawberries, and lots of other things, will be thankful for temporary shelter therein. As for what may be grown and preserved in them with

safety among bedding plants, there need be little doubt. The best of all places for the calceolaria is in such a pit. Cuttings of it put in in October and November will do finely; it is the best and most successful of all ways of growing this. Then all half hardy things may be tried in them with confidence, from cuttings and little divisions of our edging plants to the tall herbaceous lobelias, which are so very fine when in flower, but a little too tender to stand the open air in most parts of our climate.

Perfectly hardy stuff, like the variegated arabises, &c., which it may sometimes be desirable to increase largely in the autumn, will succeed well, and be ready for turning out finely developed plants for the next bedding season; while as for Neapolitan violets, and young, scarce, and delicate herbaceous plants, variegated plants, &c., which we much wish to increase, it is the very place for them. If verbenas were struck very early in the season, and, once rooted, allowed four or five weeks in the free open air before it became necessary to house them, they would thrive admirably in these pits. In consequence of gardeners generally striking verbenas too late, they are obliged to keep them in warmer or drier structures, or they would be sure to go off. The *Gazania* does capitally put in as cuttings in these pits; so does the *Nierembergia*. By the way, there is a fine new *Nierembergia* (*frutescens*), which will be found a capital bedding plant, and its best winter home will be in one of those pits; and so of all but the tenderest bedding plants. Every year we have a greater variety of subjects introduced to our flower gardens; and as most of them are of a half hardy character, or even if hardy, such as will enjoy a little protection in winter when in a young state, the knowledge of the advantages of these cheap pits cannot be too widely diffused.

Garden Enemies.

Birds.—In this month sparrows do little mischief to vegetation, as they feed principally upon the caterpillars of the second brood, which are now tolerably abundant. The robins, on the contrary, are now more injurious to vegetation than they were earlier in the season; and the greenfinch and the blackbird have no mercy on the cherries, plums, and other soft and thin skinned fruits. Birds generally are very silent in this month; and when they do utter

any sound it is more frequently a low twittering note than a song.

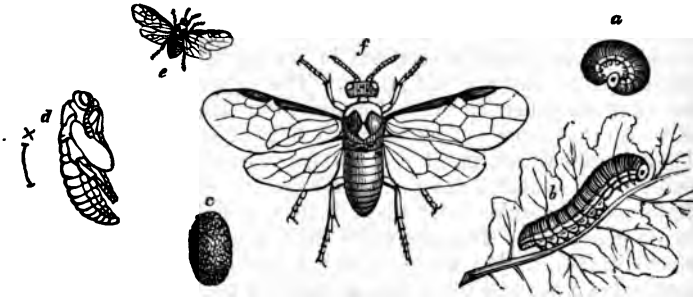
Insects.—The *wasp* is the most troublesome insect at this period, as it destroys peaches, nectarines, apricots, and all the various kinds of plums, besides getting into the vineries and attacking the grapes. It may appear strange to those who have not studied entomology, to be told that every colony of wasps arises from one single female, and that out of two or three hundred female wasps which may be found in one nest at the beginning of winter, not half a dozen will survive till the spring. When these insects recover from the lethargy in which they have passed the winter, they separate, and each female prepares to form a colony for herself, and as she appears to wish to do this with as little labour to herself as possible, wasps may often be seen in spring prying into every hole in a hedge-bank, particularly where field mice have burrowed; but if nothing of this kind can be found, the female wasp is obliged to excavate a burrow for herself out of the solid ground, which she does, Rennie informs us, by “digging the earth with her strong mandibles, and carrying it off, or pushing it out as she proceeds. The entrance gallery is about an inch or less in diameter, and usually runs in a winding or zigzag direction, from one to two feet in depth. In the chamber to which this gallery leads, and which when completed is from one to two feet in diameter, the mother wasp lays the foundation of her city, beginning with her walls.” The building material employed by wasps is a bluish-grey papery substance, which the wasp gnaws from wood, which she first bruises, so as to form it into a sort of lint, and then moistens with a glutinous liquid which causes the fibres to adhere together. “Having prepared some of this paste,” Rennie continues, “the mother wasp begins first to line with it the roof of her chamber, for wasps always build downwards. The round ball of fibres which she has previously kneaded up with glue, she now forms into a leaf, walking backwards and spreading it out with her mandibles, her tongue, and her feet, till it is as thin almost as tissue paper. One sheet, however, of such paper as this would form but a fragile ceiling, quite insufficient to prevent the earth from falling down into the nest. The wasp, accordingly, is not satisfied with her work till she has spread fifteen or sixteen layers, one above the other, rendering the wall altogether nearly two inches thick. The several layers are not placed in contact like the layers of a piece of pasteboard, but with small intervals or open spaces between,

appearing somewhat like a grotto built with bivalve shelves, particularly when looked at on the outside. This is probably caused by the insect working in a curvilinear manner. The wasp then forms her combs, which she suspends horizontally, and secures them by from twelve to thirty rods, about an inch long, and a quarter of an inch in diameter. The combs, however, though they somewhat resemble those of the bee, are not destined for the same purpose, as the common wasp makes no honey, and the cells are entirely appropriated to the rearing of the young. These are exceedingly numerous; for as soon as one brood issues from the cells, the mother wasp lays a fresh egg in the empty cell, so that several broods issue from one nest in the course of the summer; and thus it has been calculated that one female has produced thirty thousand wasps. Towards winter, however, all these die off, except five or six females, which remain in a torpid state till spring. To prevent wasps getting at fruit in houses, there is no better means than covering the apertures with very small meshed netting. Against walls they may be entrapped into narrow-necked bottles containing sweetened water, and their nests may be destroyed.

Saw-flies.—About this season some beautiful flies are seen, having four transparent wings, a long yellow body, and a black head and thorax (*Athalia Rosæ*), which (or rather the larvæ belonging to them) are very destructive to rose trees. The female is furnished with a kind of saw, which she can draw within her body, or protrude at pleasure. This saw the fly uses as a carpenter would his hand-saw, but she has the advantage of having two blades, with which she can work at the same time; and when she has selected the branch of a rose tree in which she wishes to deposit her eggs, she may be seen bending the end of her body inwards, in the form of a crescent, and protruding the saw, with which she forms a groove in the bark and wood. As soon as she has formed a groove, she lays an egg in the cavity. The saw is then partially drawn into the body, and the insect drops a frothy liquid on the egg, which glues it to its place. Another groove is then made, and another egg deposited, till the insect has laid about twenty-four. The eggs thus laid are at first very small, but they grow rapidly, and at last form little protuberances in the bark, from which the caterpillars are hatched, which, as soon as they appear, begin to feed upon the leaves of the rose tree, and often destroy them so completely as seriously to injure the health of the plant.

The *turnip saw-fly*, vulgarly called the nigger or blacks, belongs to the same genus as the saw-fly of the rose, and is named *Athalia centifoliæ*. The larva (*a* in fig. 71) is black, and it has the habit, when alarmed, of rolling itself up in a spiral manner, and joining its head to its tail; it is about half an inch in length, and the manner in which it places itself on the leaf of the turnip when feeding is shown by the magnified caterpillar at *b*. When the caterpillar is full grown, it descends into the earth, where it buries itself at a little distance from the surface, forming by the motion of its body an oval cocoon, as shown at *c*, the external part of which consists of particles of earth and sand united by a glutinous moisture, the interior being very smooth, and lined with a silvery-coloured shining matter, evi-

FIG. 71.



The Turnip Saw-fly in its different states.

dently caused by some secretion, either from the pores of the body or from the mouth, which is dried and hardened. In this cocoon the insect goes into the pupa state, as shown magnified at *d*; the black line marked by a cross indicating its natural size. The perfect insects (*e* natural size, and *f* magnified) come out of the ground from the latter end of August till the beginning of October, and particularly in the month of September, when they are so numerous that they appear to rise from the ploughed fields in myriads, colouring the air with a rainbow-like tinge when the hot sun shines upon them. The fly itself, though small, is very beautiful: its body is a bright orange, with a black head; and its wings are transparent and tinged with orange at the base. The best way of preventing the

ravages of these insects is to destroy them in the fly state; but if this has been neglected and the eggs have been laid, as soon as the insects have reached their caterpillar state, the best plan is to turn some ducks among the turnips, and to let a boy go before them with a long pole, to brush the caterpillars off the leaves of the plants. Another plan is to drag a light hurdle or a birch broom over the turnips, as when the insects have been once dislodged from the leaves, they do not appear to have strength enough to resume their former situation. Other saw-flies attack the plum, the pear, the peach, and the apricot; and in the perfect state they are all very beautiful, having brilliantly coloured shining bodies and transparent wings; and their eggs have all the peculiarity of increasing in size considerably after they are laid.

The *red grub of the plum* occasions a great number of plums to fall in this month. The moth of this caterpillar (*Tortrix nigricana*) appears in June, but it is little noticed, as it is small and almost black, and it generally succeeds in laying its eggs on the young plums before they are half grown. The eggs remain on the fruit, and they are generally hatched in July, the little grubs eating their way into the plums just as they are beginning to change colour. They remain within the skin of the fruit till they have eaten all the pulpy part; so that when the fruit falls, the skin contains merely the stone and a quantity of black matter, which is the excrement of the caterpillar. The caterpillar itself generally leaves the plum before it falls, its last act being to eat through the stalk, as it then crawls down the tree till it finds a crevice in the bark, into which it creeps to spin its cocoon.

SEPTEMBER.

General Observations and Directions.

The Weather, &c.—The weather in September is beginning to lose the warm and agreeable feeling of summer; the days shorten rapidly, and the mornings and evenings begin to feel cold. Towards the end of the month the weather is sometimes stormy, but frequently this is a very enjoyable and beautiful month.

Open Garden.—The gladiolus should be magnificent now. Often, when the leading shoot is cut for indoor decoration, side shoots come forth and keep on the bloom till nearly Christmas, a great point in its favour. This, the noblest of all autumn flowers, is not half sufficiently used. The miserable rains of many of our autumns do not hurt its flowers in the least. It is a good time to move, replant, or rearrange hardy perennials. A few of the hardiest annuals may be sown where they are intended to flower in spring.

Wall trees now only require such treatment as may help the ripening of the bearing wood. Over-luxuriant spray that interferes with this should be removed, and overcrowding prevented, so that the wood selected to remain may get all the benefit of the autumnal sun. It is almost needless to add that the wood selected to remain should be trained in regularly, as the closer the wall the more heat it obtains, and there cannot be too much heat and sun for fruit trees in this cloudy clime. If any transplanting or root pruning of fruit trees has to be done, attend to it as soon as possible; if the weather is fine, it is much better and pleasanter to do it now than to defer it till the ground is saturated and the days short. But the main employment of the coming few weeks should be all sorts of alterations and plantings of evergreens, trees, conifers, edgings, making of new beds, or in fact anything and everything in the way

of improvement. Gather nasturtiums for pickling. On wet days look over the stores of onions, throw away refuse and decaying bulbs, and bank or store the rest in a dry, cool place. Take up potatoes and store in narrow ridges, exposing the tubers to the light as little as possible, except in the case of those intended for sets, which may be allowed to get green. Gather the fruit of tomatoes, and place them to ripen on a warm shelf in a greenhouse, or some such position. Most kinds of pears and apples must now be sharply looked after. Pears are fit for gathering, as a rule, when the fruit freely parts from the stalk on being gently lifted by the hand to the horizontal position. Touch pears as little as possible. Onions should be taken up when the weather is dry, and ripened in an airy, dry place previous to final storing. Take up carrots and store in dry sand in a cool and dry shed. Prepare the ground for general winter cropping. Sow a good batch of turnip radishes, also small salading, the last to be sown under handlights. Thin out prickly spinach, turnips, &c. Endive should be tied for blanching when quite dry, and the largest plants of the young cauliflowers sown last month pricked out in frames. Let cauliflowers under handlights have as much air as possible. Plant cabbages for spring use and pretty thickly, as the intermediate plants may be used as coleworts. Celery should now be rapidly progressing, and the crops that are sufficiently advanced should be well earthed up, using quicklime and soot freely where slugs do much damage to the crops. Lettuces should be pricked out in various positions, well drained and warm.

Indoor Department.—It will soon be time to think of preparing to bring in the greenhouse plants, &c., that have been out during the summer; but previously the houses should be cleaned and prepared for their reception, and the plants neatly staked and otherwise attended to before they are put in. If any painting of woodwork, glazing, &c., remains to be done, it should be finished at once, as heavy rains, or premature cold, or something or the other may occur; and it is not at all good gardening to place the winter's stock and greenhouse things in pits or houses in a dirty or imperfect condition. If a house empty, or nearly so, at this season, does not want painting, &c., it should be thoroughly washed in every part with a stiff water engine, or brushes and the syringe, to dislodge vermin as well as clean the glass and crevices. However, as long as the weather is at all fine, keep things out of doors, as

the warm dense rains of autumn do much more to clean plants than anything that we can do indoors. They should not be placed in the shade of walls, &c., as is frequently the case, but have all the sun and air possible. In all great flower gardening places now the young stock of bedding geraniums, and much else in this way, will be in a very forward state, and should be freely exposed to the air. It is of course too late to insert geraniums in the open ground. Any cuttings made after the end of August should be put in pans, pots, or boxes, and placed in a warm spot from which they can be taken indoors at a moment's notice, but the majority of the cuttings of bedding plants should after this date be inserted in gently heated frames or pits. Those rooted in the open ground may now be taken up and potted in any way that may be convenient. Rough shallow wooden boxes are the best, and much the cheapest things, in which to store bedding geraniums of the green type. All that are well struck now should be placed out of doors on a hard bottom to harden off for a few weeks; and when they are put into the frames again, the lights of these should not be put on for a considerable time to come, except in case of heavy rains or unseasonable cold. The more of the free air, sun, and light these plants get for weeks to come the easier will be their preservation through the winter months. If anything remains to be propagated no time should be lost in getting it done. Calceolarias of the hardy bedding kinds may be propagated towards the end of this month. Take short, stubby shoots off, and after preparing, prick them into fine soil with a considerable portion of leaf mould and sand in its composition. Cover with a hand glass, either in the open air or in an uncovered pit, with a northern aspect. They may, however, be inserted much later than this date, and every cutting root.

If you are fond of flowers at Christmas and in January, it is time to prepare for them now, and see that, in addition to bulbs, some nice little shrubs are at hand, ready to start in heat. *Deutzia gracilis*, *Prunus sinensis* fl. pl., Persian lilac, and various other shrubs may be had in flower very early where there are warm houses. The varieties of *Epiphyllum truncatum* flower beautifully and profusely at Christmas, and no plants are better worthy of culture wherever there is a warm greenhouse or cool stove. *Dielytra spectabilis* is also easily forced and very graceful and pretty. The azaleas too are readily started into flower in a

briskly warm and light house, while the epacris and winter flowering heaths come on naturally in a cool house. After the azaleas and general greenhouse things have been brought into their winter's quarters from the open air, it is desirable to give them as much air as possible, keeping the plants so arranged that each receives a fair supply of light, and is not overshadowed by its neighbours. Do not put the small things between the large ones, as many do, thereby depriving them of light; but arrange them by themselves, and have all such small plants as primulas on shelves near the glass, where they may enjoy every ray of light. Bedding and young and unimportant plants may be placed between and under the larger ones—things at rest for instance, like fuchsias, but not anything from which you expect a presentable bloom at no distant day. Clear liquid manure water should be given to chrysanthemums once or twice a week, and plenty of pure water every day in case of strong plants. Thin the buds where fine individual blooms are required. The seedsmen have not yet got their stocks of the mixed bulbs, so there need be no hurry about these, but the hyacinth and pot bulbs may now be potted with advantage, though there is no hurry unless wanted very early. Where forcing is carried on, kidney beans may be sown for use in early winter. Melon frames should be kept warm and close, and fire applied if convenient. Grapes that are ripe, and those that it is wished to preserve long on the trees, should be looked over occasionally, and bad berries removed. In late houses too the borders should be protected from wet, and the atmosphere must be kept dry by using gentle fires in wet and damp weather. At the end of the month it will be time to remove shading from houses generally. Make mushroom beds in suitable places, and beds made now should yield a supply all through the winter and early spring.

Things not to be done in September.

Never put common bedding plants, pelargoniums and the like, in pots: rough boxes that can be cheaply made out of any common boards, unplanned or otherwise, by any ordinary labourer, are very much better. These boxes are best about five or six inches deep, about twelve inches wide, and from two to three feet long, but in

some places it may be found desirable to adapt the boxes to the size of the shelves of the houses.

Never allow the flower garden to be disfigured by decaying blooms of any kind.

If repairs of the hot-water apparatus or flues, or the thorough cleansing and repairing of all glass-houses and pits are not completed before the commencement of this month, do not defer it a day longer.

In cleaning glass or the woodwork of hothouses, pits, or frames, never use anything but water with a little soap, as soda, potash, or even too much soap, may loosen and spoil the paint.

Never allow mouldy berries to spoil good bunches of grapes, but cut them out as soon as seen.

Never gather fruit in the rough way frequently adopted: all worthy of a place in the store-room should be carefully and gently gathered by hand.

Never allow any plant infested with insects to be placed with clean plants.

Never cut off the roots of a plant when repotting.

Never give plants of slow growth a large shift at this season of the year.

Never allow moisture to get to the roots of half hardy plants against conservatory walls after this time, until they commence growing in the spring.

Never keep lilies out of the ground a moment more than may be necessary for planting or transplanting them.

Principal Operations in September.

Spring Gardening.—The style of gardening known by this name has been much talked of of late years, and well deserves the attention of the amateur. Spring gardening, in a very wide sense, has been for ages a fact in British gardens, as nearly all the flowers of our gardens were spring flowers, but what is now alluded to is the system of bedding out spring flowers. As soon as the summer flowers have passed out of bloom in autumn, the spring flowers that have during the summer been in the kitchen garden or any spare piece of ground take their places. Though yet too soon to despoil our flower beds, it is high time to be thinking of the stock

of bedding spring flowers. The system was first brought to perfection by Mr. Fleming, the head-gardener at Cliveden, who would deserve the thanks of the gardening public if he never did anything but call their attention to this lovely phase of gardening. We may perhaps best describe the system by telling what it is and how it is carried out at Cliveden. Every bed is full to overflowing with plants, and every bed is alight with some spring flower—in many the colour a dense mass, impossible to attain from summer flowers—in some the colour utterly distinct from anything to be seen in the summer garden—in all, beauty of the most exquisite kind. And this at a season when most people's gardens are bare and desolate! Generally we wait till May and June before preparing the garden for its flowers, and no doubt we are satisfied of the wisdom of this plan, or it would not be so universally pursued. Here they bed out too, and that on a very extensive scale; but having tried and proved the spring garden, and found its decided superiority, even *considered from the point of colour alone*, they naturally now give it the first place. Do you ever get such beauty of colour from your summer plants as that afforded by that dense mass of silene, or by those waving beds and lines of double daisies, self-coloured pansies, and forget-me-not, Mr. Fleming? "I," Mr. Fleming replies, "never can equal it with bedding plants in summer, nor have I ever seen it equalled." People say that these interesting flowers were all very well for those who really know plants, but that the public want something brilliant and telling, and we only wish that those who take such peculiar care of the public could all look on those Cliveden gardens. A single glance would cause a total change in their opinions. There is in the courtyard or quadrangle on the north side of the mansion a circular piece of grass, and in its centre a healthy graceful young deodar, say about ten feet high. It is on a sloping grassy mound, and a little way down it is embraced by a bed planted with diamonds of pansies, blue and white alternately. The upper half circles are planted with white daisies, and the lower with red. As the bed slopes rapidly outwards, and every inch of it is vivid with colour, the eye is caught by its beauty as the visitor goes up the great avenue of lime trees, and there alone in its glory he must pronounce it a very gem of colour and tasteful planting. It is one of the prettiest designs ever seen in a garden, and one which the poorest cottager could make. Perhaps the single band of colour round the tree,

and in the midst of the grass and ivy (for there is, it should be stated, a belt of ivy outside the flowers, and at some distance from them), enhances the fascinating effect of the scene, and certain it is that were there many other beds in its neighbourhood, the effect would be different, and probably much less attractive.

The forget-me-nots known as *Myosotis sylvatica* (the wood forget-me-not) and *M. dissitiflora*, should be grown in every garden where spring flowers are admired, the last being most suited for moist districts, but neither are difficult to grow on ordinary soils. *M. sylvatica* usually fills many of the beds in the great flower garden, both in its normal form and mixed in equal quantities with its white variety, and occasionally in the white state alone. But what a glorious mass of it is this, four feet wide, running round a clump of flowering rhododendrons in the woods! It is even larger and richer here than in the open; but walk along till you come to the wilder part of the dense high woods, and go up and down the precipitous drives and grass walks, and you will meet with it in well grown tufts here and there among the long grass, where it is not disturbed, but in fact quite wild, and then you may see its true value, and the great claims it possesses for liberty to take up a position in our half wild shrubberies and wood margins. But beautiful as is the blue furnished by this to the Cliveden garden, the rose of *Silene pendula* is better still in its own way. It need hardly be said any more about, as everybody knows that it should be sown in August, and dibbled carefully out when the bedding plants are removed. Its white or cream-coloured variety looks well when mixed with the rose, and may occasionally be used alone. The rose kind is one of the most valuable of all known plants for the spring garden, and will remain a mass of flower, and indeed continue to improve every day till the latest moment it is possible to delay the planting of the summer bedders. At Cliveden they very sensibly abstain from mowing spots where wild flowers do congregate, and what is the use of mowing the wilder parts of pleasure grounds? Tulips may be seen dotted over these masses of spring flowers earlier in the season, and as they flower before the *silene*, wallflower, and *myosote* come into full bloom, and are indeed removed before these, two distinct aspects of beauty are had from the same beds during a few weeks, and in some cases three, by a little management. The tulips are planted at least a foot apart, and then the effect from the mansion and terrace is very

fine—the bosses of red tulips, for instance, dotted over the single Italian wallflower, makes it look more gorgeous than anything I remember to have seen out of a theatrical wardrobe. No need to describe the propagation and culture of the tulip, nor of the single wallflower. The dwarf single Italian and single yellow are the kinds used. These single kinds are best sown in April, thinned out a little, and kept in the same beds till the time has arrived for planting in autumn.

Of all the plants used at Cliveden, or in any other place, for spring gardening, nothing beats the pansy—most richly coloured and beautiful of all lowly herbs. Did anybody ever see vases so lovely as these along the top of the terrace wall, each with its dense crop of flowers—Cliveden Blue, Cliveden Yellow, Cliveden Purple, or Cliveden White, or the singular looking and free and pretty Magpie pansy? And by looking down on the wavy border at the foot of this terrace, or rather going down to see it—and nobody can see it and forget it—it may be seen how excellent it is as a ribbon plant for associating with the double daisies, *Gentiana acaulis*, *Saxifraga granulata pleno*, *Aubrietias*, and *Alyssum*. If Cliveden contained no spring gardening but that of this wavy border against the terrace wall covered with climbing roses and *Wistaria*, its fame would be well deserved. It is a slight raised border, the edge—about a foot high—being covered with ivy pegged down close. As for the rest, it is a waving, accurately graduated mass of vivid colour, afforded in almost every instance by plants having associations, as well as beauty to recommend them, from the stocks and anemones against the wall to the daisies, pink, red, and white, and the several lines of pansies coming towards the front of the bed. You stand on its south side, and every flower of the thousands of pansies looks towards you; the daisies are a mass of their pretty coloured flowers; the mixed line of silene is firm and solid looking, but flushed with dense bloom; and behind it wave the windflowers—red, white, and blue. The varieties of pansy used are free growers, and readily increased. They are propagated by division, and by cuttings struck under hand glasses, &c., the whole to be kept in nursery beds till the autumn planting time comes on. It can hardly be necessary to state how freely they are raised from seed.

Of the daisies, the kinds chiefly used are the double quilled white and the best double red, and the pink. You can hardly see the

foliage, so densely do these flower in these beds. Nothing can be easier than their propagation in almost any soil, though they do all the better if it is rich and free. They may be plentifully raised from seed, and perhaps that is the best way for the amateur to go to work; but in places where it is desirable to have quantities of a few distinct colours, they must be increased by offsets. The *Alyssum saxatile*, so well known, is used pretty freely: that it may be raised in abundance from seed need not be told. *Iberis saxatilis* and *Arabis alpina* are also freely used, especially in raised beds and vases: they may be grown in abundance from cuttings inserted at almost any season. In the baskets and vases and raised beds in which they figure the centre is formed of the common Honesty (*Lunaria biennis*) or rather the now-a-days uncommon Honesty, for has it not almost disappeared from gardens generally? Cliveden is likely to make it popular, for nothing could be richer or more beautiful than the display it makes here both in its purple and white forms. It is treated as a biennial of course, and is wild on the chalk banks near the edge of the Thames. As it grows a yard or more high, it is quite a relief among the low-growing spring flowers. The *Collinsias* are not much used at Cliveden now, but they are made a fine feature of at Berryhill, the tastefully laid out and well managed gardens of Mr. J. Noble. Sow early in September, or in pots indoors in January, and plant out when sufficiently grown and hardened off. Annuals in the way of *Limnanthes Douglasii* and *Lasthenia californica* may be sown early in the present month.

But what about those extensive plantations of giant polyanthes and coloured primroses from Devonshire, in such rich luxuriance and wonderful purity of colour, and lacing, and size? Well, they are among the most valued plants in the place, and among the most easily grown and propagated. They are increased from offsets with the greatest ease, and from seed as free as a wallflower. The seed from this collection would be most valuable. But a pleasing variation is almost certain to occur from every packet of polyanthus seed that is sown. Here, as a rule, they are treated like most of those named—that is, kept in store beds all the summer, and then planted out on mild autumnal days, when they root readily into the genial soil, and flower profusely in spring. They may with equal taste be planted around shrubberies in thin woods, and indeed in many positions about a country residence. The Lily of the Valley, the blue *Anemone apennina*, and such perennials are being natu-

ralized here, and as to grow they only require to be planted, nothing need be said on the score of culture. *Saxifraga granulata pleno*, by the way, was almost forgotten. This densely flowering little fellow, of which such handsome tufts may be seen occasionally in cottage country gardens, makes a capital spring bedder here among other dwarf and pretty little things in the "Duke's garden," which is a quiet one not tied down to any geometrical plan, but, having small beds, each differing from its neighbour, and containing a lot of interesting arrangements, such as diagonal lines of *Aubrietia*, the angles filled with bright red and white pansies, *Gentiana acaulis* mixed with white daisies, and so on.

It may be asked, Is this kind of gardening possible in all parts of England? It is quite so in forty-nine gardens out of fifty; and there are many parts of England and Ireland far better suited to its development than the neighbourhood of Maidenhead. All sorts of gardening are difficult near large towns, but even near such, on light soils, it is possible; and our only fear would be on such clayey soil as that north of London, and even there it could be done sufficiently well to be very attractive.

A look at the kitchen garden in summer or early autumn would explain at a glance how simply these spring bedding plants are cultivated; a seedling plant about an inch and a half high fills the alleys between the asparagus beds. That is our friend *Myosotis sylvatica*, the delightful wood forget-me-not, which for many weeks in June will do more to beautify with its exquisite blue these shady wood walks and great flower garden beds than any exotic plant in the garden. There seems to be as much of it here as would plant a dozen large gardens. Mark how easily it is grown in the oft unused asparagus alleys. And so with the white variety of this myosote, not so fine as the blue, but still useful as affording variety, and also the silene and wallflowers; while here and there a four-foot bed, or two or three of them, are seen among the vegetable slips filled with the pretty double daisies which flower so profusely here. Nothing in the world is easier of culture and propagation than these. After taking them out of the beds in spring they are popped into the kitchen garden ground, and they increase almost as fast as greenfly. For instance, six plants of a new kind were obtained here in spring, and now they have increased to nearly 500! Along borders in the several divisions of the kitchen garden are numerous rich beds of polyanthuses and primroses cast-

ing up fresh blooms, and those clearly-coloured thoroughly useful and hardy Cliveden pansies are also dotted over with fine flowers, and probably these will go on flowering during the winter if it prove mild. Like all the perennial plants, these were planted here when taken from the flower-garden at the end of May. The greater number of annuals will do well sown early during the present month, but the biennials had better be sown at midsummer, and wallflowers and all perennial flowers raised from seed in early spring.

As a great number of the plants used for spring gardening are very easily raised from seed, no amateur need be without a stock; the perennials used grow so freely that there can be no difficulty in getting together a stock of them at this season, and where a collection does not exist, time could not now be better spent than by making old-fashioned country and cottage gardens abound with subjects which may be effectively employed in the spring gardens. However, spring gardening has become so very popular of late that it is now much easier to procure plants than it used to be half a dozen years ago. Now, and not spring, is the time to prepare the plants—the spring the time to enjoy them. In places where a late autumn bloom of bedding plants is of no consequence, or where they have lost their beauty earlier than is usually the case, or where there are empty or unsatisfactory beds, the planting may be commenced at the end of this month, but generally the following month is the time for the chief planting. As for planting spring flowers with a view to make them wild in woods, or growing them in other ways than as bedding plants, now is as good a time as it can be performed.

Hardy herbaceous and alpine plants.—These specially merit the attention of the amateur gardener, who should always possess and enjoy his mixed border with the dwarfer alpine plants along its front margin, and taller herbaceous plants gradually receding to the back. A very appropriate back to the mixed border is formed by a hedge of hybrid perpetual roses on their own roots, trained to a neat trellis of galvanized wire. The following list comprises the very cream of these plants. A good selection is everything, as weedy plants have tended to bring this kind of gardening into disrepute.

A selection of first class and easily cultivated herbaceous plants.—*Adonis vernalis*; *Anemone apennina*, *sylvestris*, and *japonica*; *Hono-*

rine Jobert, fulgens, and coronaria, the common wind anemone in variety; *Aquilegia*, californica, and cœrulea; *Delphinium*, in fine variety of both new and old kinds, herbaceous *Pœonia* ditto; *Ranunculus acris* fl. pl., amplexicaulis, and *R. aconitifolius* fl. pl. (the old Fair Ladies of France); *Epimedium pinnatum elegans*, *Dielytra spectabilis*, *Baptisia exaltata*, *Coronilla varia*, *Galega officinalis alba*, *Lathyrus grandiflorus*, *L. latifolius albus*, *L. rotundifolius*, *Orobis vernus* and its varieties, *Lupinus polyphyllus*, *Achillea ægyptiacum*, *Eupatorium*, aurea, and rosea; *Aster versicolor*, elegans, turbinellus, and amellus; *Echinops ritro*, *Pyrethrum roseum*, single and double in variety, and *Pyrethrum uliginosum*; *Phlox*, a good selection of the herbaceous kinds; *Campanula carpatia*, and *C. c. alba*, *C. persicifolia*, grandis, macrantha, pyramidalis, and rotundifolia; *Statice latifolia*, *Papaver bracteatum*, *Gentiana asclepiadea*, *Iris pallida*, germanica, De Bergii, pumila, jacquesiana, amœna, flavescens, and florentina; *Tritoma grandis*, and glaucescens, *Stenactis speciosus*, *Hesperis matronalis* fl. pl.; the fine old double varieties of the wallflower, *Chieranthus alpinus*, *Potentilla*, best vars.; *Trollius napellifolius*, *Pentstemon* in fine variety, *Veronica amethystina* and corymbosa, *Tradescantia virginica* in variety, *Lythrum roseum superbum*, *Hemerocallis flava*, *Armeria cephalotes*, *Geum chilœense*, *Physostegia virginiana*, *Parmica vulgaris* fl. pl., *Symphytum bohemicum*, and caucasicum, *Eryngium amethystinum*, *Dodecatheon Meadia* and varieties, *Monarda purpurea*, and didyma, *Salvia argentea*, *Helianthus multiflorus* fl. pl., *Alyssum saxatile*, *Iberis correæfolia*, saxatilis, and Tenoreana, on light soils; *Arabis albida*, *Aubrietia grandiflora*, *Hepatica angulosa* (the common hepatica should of course be grown in variety), *Helleborus niger major*, *Centranthus ruber*, and white variety, *Epilobium angustifolium album*, *Sedum spectabile*, *Pentstemon procerus*, *Rudbeckia Newmanni*, *Gaillardia pinnatifida* and *grandiflora*, *Funkia grandiflora*, *Lithospermum fruticosum*, Pinks, Carnations, Picotees, *Linum narbonense*, monogynum, and perenne album; *Genista sagittalis*, *Ononis arvensis alba*, *Astragalus monspessulanus*, *Vicia Cracca* (a British plant), *Oenothera macrocarpa*, acaulis, and Lamarckiana; *Morina longifolia*, *Liatris spicata*, *Doronicum caucasicum*, the tall herbaceous kinds of *Lobelia* in variety (these will require to be taken up in winter in most parts, and kept in a shallow box under a stage or in some such place), *Platycodon grandiflorum*, *Asclepias tuberosa* (good soil), *Onosma taurica*, *Anchusa italica*, and *Euphorbia cyparissias*.

In addition to the preceding, many of which are rather tall, the dwarf Campanulas, Phloxes, Sedums, Sempervivums, Saxifragas, &c., should be planted abundantly along the front margin of the mixed border.

Gathering and storing fruit.—This is a subject rarely sufficiently attended to by amateur gardeners. And first as to the gathering. There seems to be no difficulty about this in the case of most fruits, to gather them when they are ripe being all that is required, but in the case of the pear it is considered best to gather them before they are ripe, and allow them to ripen indoors. Pears that ripen in autumn should be gathered at intervals in September of a week or so, taking the most advanced, and before they ripen on the tree. Winter pears must be left later, say till the early half of October.

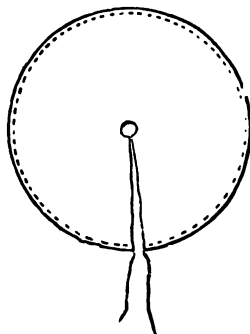
In the month of February, 1869, a few prizes brought together a considerable number of fine apples and pears from various exhibitors, and the fruit was in such good preservation that the mode of keeping it in the various cases was inquired into. The following is a *précis*, published by the Royal Horticultural Society, of the communications received :

1. As the flavour of fruit is so easily affected by heterogeneous odours, it is highly desirable that the apple and pear rooms should be distinct.
2. The walls and the floor should be annually washed with a solution of quicklime, to which common salt is sometimes added. (Salt is objectionable.)
3. The room should be perfectly dry, kept at as uniform a temperature as practicable, and be well ventilated : but there should not be a thorough draught.
4. The utmost care should be taken in gathering the fruit, which should be handled as little as possible.
5. For present use the fruit should be well ripened ; but if for long keeping, it is better, especially with pears, that it should not have arrived at complete maturity. This point, however, requires considerable judgment.
6. No imperfect fruit should be stored with that which is sound, and every more or less decayed specimen should be immediately removed.
7. If placed on shelves, the fruit should not lie more than two deep, and no straw should be used.
8. Where especially clear and beautiful specimens are wanted, they may be packed carefully in *dry* bran, or in layers of *perfectly dry* cotton-wool, either in closed boxes or in large garden pots. Scentless sawdust will answer the same purpose, but pine sawdust is apt to communicate an unpleasant taste.

9. With care early apples may be kept till Christmas, while many kinds may be preserved in perfection to a second year.

Plant Houses.—In the last week of this month, the more tender kinds of greenhouse plants should be taken in, particularly the orange and lemon trees, and all kinds of succulent plants. When the plants are first taken into the house, the glasses should be kept open during the fine part of every day, and at night also if the weather is mild; but when the nights get cold, the house should be closed about five o'clock, and opened again early in the morning if the weather is fine. If vines are grown in the house, it is advisable to keep the greenhouse plants out of it as long as possible, as the moisture from the plants will soon rot the grapes. The plants in this case may be placed in a sheltered situation till the grapes are gathered, or kept in cold pits where they can have the full benefit of the sun and air and yet be protected from cold and wet. The greenhouse plants should be pruned and trimmed before they are taken into the house, and all weak shoots, dead branches, and decayed leaves should be removed. Any plants that are infested with insects should be washed with a sponge, and if a hard-wooded plant, the stem should be brushed; and then, the pot being laid on its side, the plant should be well syringed on the under side of its leaves; first, with cold water, and if that does not prove sufficient, with water heated to 140° or 150° , which Mr.

FIG. 72.



*Cloth for tying over the
Surface of Pots.*

Barnes, the late gardener at Bicton, assures us is sufficient to destroy the mealy bug, coccus, or any other kind of insect which infests greenhouse plants at this season. Mr. Barnes's plan is, first, to provide a piece of cloth, cut in a circular form, a little larger than the pots, and with a slit or opening half way across it to admit the stem of the plant, as shown in figure 72. A broad hem or string case must be made round the circumference of the cloth, in which a string must be inserted, so as to draw and tie round under the rim of the pot. A good handful of moss should be put "underneath the cloth, so as to keep all tight together, and prevent the earth from falling out, and the hot

water from getting to the roots of the plants," &c. Two bricks should be then provided, and the rim of the pot rested upon them, as shown in fig. 73, "so as to admit of the plant being raised or lowered in an oblique direction without touching the ground: this will also admit of turning the plant round at pleasure, so as to allow of syringing every part of the plant, as well over the surface of the leaves and heads of flowers, as on the under side of them, so that hot water may touch every part of the plant except the roots." It must be observed, that the plant must be syringed, and not watered; as through a syringe, water as high as 154° may be applied to the leaves of a plant without

FIG. 73.



Mode of placing Plants in Pots when they are to be syringed with hot Water to kill Insects.

injuring them, while water 10° or even 20° lower would scald the leaves if poured upon them in a continuous stream from a watering pot. Many plants may be well cleaned by being syringed in this way with water no higher than 70° or 80° , or indeed the ordinary temperature. Mould and dirt of every kind should be washed from the branches and leaves of those plants that are taken into the house; the surface soil in the pots should be stirred; any liverwort or moss that may have formed should be removed; and if the earth in the pot looks wet and black, its upper part should be

loosened with a stick and shaken off, its place being supplied with fresh compost of the kind adapted to the plant. The whole of the plants should be turned out of their pots, to see that the drainage is complete; and if any deficiency is observed, fresh potsherds should be put in. The outsides of all the pots should be washed quite clean before they are put into the house.

Garden Enemies.

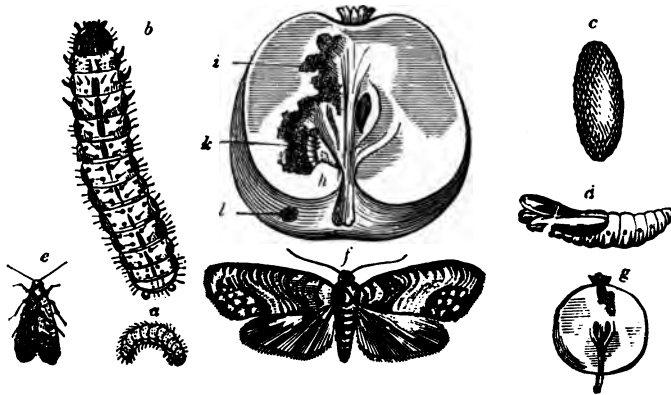
Quadrupeds.—In this month hares and rabbits frequently recommence their ravages upon pinks and carnations, and the young plants raised from layers are particularly subject to their attacks, probably from being more tender and succulent. Squirrels are also found abundantly in the woods, feeding on acorns, nuts, and other seeds, and particularly on the seeds of the pine and fir tribe, of which they eat great numbers. They are said to be particularly fond of the seeds of the Swiss stone pine (*Pinus Cembra*), and those of the Italian stone pine (*P. Pinea*).

Birds.—The blackbird and thrush continue their ravages, but in a much smaller degree during this month, the greater part of the fruit on which they feed having been gathered. The redstart eats currants, raspberries, and elderberries; the garden fauvel, or nettle-creeper, the beautiful little blackcap, and the whitethroat, which are all very fond of the sweet juicy cherries (in fact, few of the birds common in gardens appear able to resist the temptation offered by this kind of fruit), spare the morello cherry, which is now ripe, and rarely touched by birds. As pears and apples begin to ripen, they are frequently attacked by sparrows, robins, and other birds; as are plums, particularly the large yellow plum called the magnum-bonum, or egg-plum. Generally it is the soft-billed birds, which live partly on insects, that attack garden fruit at this season; as the hard-billed birds, which live entirely on vegetable substances, prefer nuts and other seeds.

Insects.—When the first apples or codlings ripen, on cutting them open there is frequently found a small reddish-white grub, which has devoured nearly half the interior of the apple, and left in its place a quantity of little black grains. The perfect insect belonging to this caterpillar is called the *codling moth* (*Carpocapsa Pomonella*), and is of a light grey, with delicate dark streaks, disposed in

a wavy manner so as to resemble damask ; and on each of the four wings is a large reddish-brown spot, partially encircled by a golden band, in the form of a horse-shoe (see *f* in fig. 74 which represents the moth magnified, while *e* shows it of its natural size). The hind wings are of a brownish-red, with somewhat of a golden hue, and they are bordered by a broad light fringe. The moth flies at night ; and it is usually first seen in the beginning of May, though it continues to be found at intervals through all the summer months. So few, however, appear, that it is seldom noticed till the latter end of August or the beginning of September, when it is

FIG. 74.



The Codling Moth in its various states.

found in large broods ; and the female moth may be seen laying her eggs in the hollow part of the apple, quite close to the eye, or in the eye itself, whence it eats its way downwards, leaving a quantity of excrementitious matter in the form of small black grains, as shown at *g*. The egg of the moth is generally laid when the apple is quite small, and the ravages of the larva in its progress downwards do not seem to prevent the growth of the apple, which swells out as it would have done if it had not been attacked ; and as the larva feeds only on the fleshy part of the apple, as shown at *h i*,

without penetrating the rind, its ravages are unnoticed till the greater part of the apple has been destroyed. As soon, however, as the larva begins to feed on the pips of the apple, as shown at *k*, the fruit falls, and the caterpillar, ceasing to feed on it, makes its way out by eating a hole through the rind, as shown at *l*. Sometimes the larva, if not full grown when the apple falls, continues feeding upon it after it has reached the ground, and hence in some cases it is found in the apple; but most commonly it makes its escape as soon as the apple falls. In the summers of 1822 and 1846, which were particularly warm and dry, nearly two-thirds of the apple crop fell in this manner before the apples were half ripe, and every apple that was picked off the ground was found to be grub-eaten. As soon as the caterpillar leaves the fruit, it climbs up the apple tree, chooses a place amongst the loose bark, where it makes itself a kind of nest, and spins a web over it, so as to form a cocoon, as shown at *c*, in which it remains till it is ready to issue forth as a moth. In fig. 74, *a* represents the larva of its natural size, and *b* its appearance when highly magnified; it is of a dirty flesh colour, with a brown head and brown spots. The chrysalis is shown at *d*, highly magnified; it is of a pale brown, and it is armed with teeth, like the chrysalis of the rose moth, to assist it in getting out of its cocoon. It may be observed that the insect remains in the cocoon state frequently for eight or ten months, so that the trees should be again examined when they are in blossom and carefully brushed and cleaned, all the loose bark being removed, as most probably it contains some of the cocoons. As to the best means of destroying this pest, see garden enemies for June.

In the month of September celery plants are occasionally found to have brown spots upon them (see *a* in fig. 75), and some, instead of these brown spots, have little transparent blisters. On holding the plants which are blistered up to the light, a little maggot will be seen moving under the thin skin raised by the blister; and when it has eaten the solid part immediately under the skin, it proceeds to another place, and the skin of the deserted blister withering, it forms a brown patch. "On examining the leaves, and opening part of the withered portion of the leaf (fig. 75, *b*; *a*, withered part of the leaf; *b*, portion of the withered part raised up, to show the state of the interior, *c*), the interior was found to be quite destitute of pulp, and to contain one or more small green maggots, which had eaten up all the parenchyma,

leaving only the two surfaces of the leaf entire, but very thin." Sometimes as many as five are found under one blister. The appearance of one of these larvæ under a magnifying glass, as shown at c in fig. 75, is very similar to that of the onion fly, but the colour is a delicate green, and the sides of the body are very transparent and glassy. "When the larvæ are fully grown," observes Mr. Westwood, "they quit the leaves and descend into the ground, where they gradually shortly afterwards appear to lose all vitality, their form becoming shorter and oval, with the segments distinct, and terminated at each end by two obtuse points (fig. 75; d, natural size; b, magnified.) The outer skin of the larva is not cast off, but becomes a hardened pellicle, within which the real

FIG. 75.



The Celery Leaf Miner in its different states.

pupa is to be found. In this state the insect remains buried in the ground until the following spring, when the warmth gives birth to the imago, which is one of the most beautiful of our species of two-winged flies; and which, after throwing off its pupa skin, and bursting through the hardened pellicle of the larva, crawls to the surface of the ground, and then takes flight. The perfect insect (*Tephritis onopordinis*, Fabr.) is shown of its natural size at E. The general colour of the body varies from a rusty brown to a shining black. The legs and short wings are yellow, and the wings are black, with numerous limpid spots of various forms and sizes. The motions of this fly are very peculiar; when seated on a leaf in the

sunshine, its wings are carried partially extended, and at the same time partially elevated; and it has a sidling motion in flying quite different from the flight of most other flies. From the small size of these flies it is extremely difficult to destroy them in the perfect state, though Mr. Westwood suggests hanging lines of string covered with birdlime over the rows of celery. He adds, "the plucking off of the infested leaves, or the crushing of the larva with the hand without destroying the leaf, is recommended by Major, and appears very likely to be successful, if adopted in the beginning of the summer, as the destruction of one grub at that period will prevent the production of a numerous progeny," as there appears little doubt but that, like the house fly, this insect produces several generations in one year.

There is another species of leaf miner very nearly allied to the above (*Tephritis artemisiae*), which attacks the chrysanthemum, in the leaves of which patches are found enclosing maggots precisely similar to those of the celery. The maggot of the chrysanthemum, when removed from its bed, is of a glossy pale green, and is almost transparent. It descends into the ground to undergo its transformations, and it becomes an orange-coloured or buff fly, with a few black bristles about its head, and a few black spots in its almost transparent wings. The only remedy is hand picking. This insect is very destructive to the chrysanthemum, the leaves of which it mines, passing under the epidermis of the leaf like the leaf miner of the celery. The fly is a beautiful little creature, particularly when it sits upon a leaf with its wings partially extended and slightly elevated, which is its general position. The caterpillar has two bent hooks or mandibles, like scrapers, with which it contrives to destroy the parenchyma of the leaf.

It is a striking provision of nature that at this season, when so many moths and butterflies are hatched from the caterpillars which have been feeding on the summer fruits, an immense number of spiders appear, by which great quantities of the various insects on the wing are destroyed; many of them probably without laying any eggs, as no food is obtainable for the caterpillars which would be hatched from them till the following spring. In September also great numbers are seen of the harvest or shepherd spiders (*Phalangium Opilio*). These very curious creatures are generally found attached to a wall, on which they lie quite flat, and have a very singular appearance from the small size of the body, which is

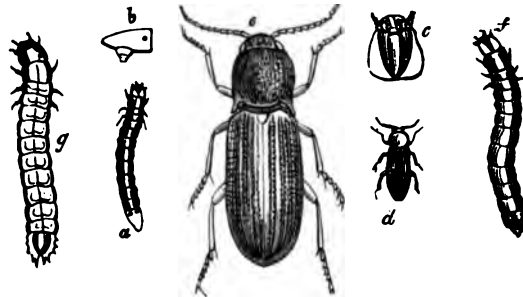
oval or round, and the enormous length of the legs, which are not thicker than hairs. When surprised they run with extraordinary rapidity, their legs being so disproportionately long that they seem to walk on stilts. The legs of this spider are very easily detached from the body, and when the insect is caught, it often leaves two or three of its legs behind it in making its escape. These legs possess extraordinary vitality after they are separated from the body, but the loss of a limb does not appear to have any bad effect upon the insect: and it also appears to have the power of reproduction, as these spiders are often seen with some of their legs much smaller than the others. They feed on other insects, and are said to be very rapacious. They are often found on the ground among grass, and under stones.

Flies are very troublesome at this season, and the large blue-bottles often bury themselves in plums and other fruits. In the plant houses several insects are found feeding at this season on the succulent stems of the geranium. One of these is the caterpillar of the curious elephant hawk-moth, which takes its name from the peculiar property possessed by the caterpillar of stretching out the fore segments of its body into a long neck or snout; and hence the French call these caterpillars *cochonnées*, or piglike. The English name of elephant hawk-moth alludes to the same peculiarity, the long snout being supposed to bear some resemblance to the proboscis of an elephant. This caterpillar is also frequently found feeding on the vine, the French willow herb, and some other plants.

Towards the end of this month, turnips, potatoes, carrots, the stems of cabbages and lettuces, and the roots of pinks, lobelias, &c., and also several kinds of bulbs, are found partially devoured by a kind of grub generally called the *wireworm*. When disturbed it creeps quickly, with a sliding kind of motion, with its tail bent on one side, somewhat like the letter S. (See *a* in fig. 76.) There are two other kinds nearly allied to the wireworm, which are shown at *f* and *g*, but which differ in the terminal section of the body, which in the true wireworm is furnished on the under side with a large fleshy retractile tubercle (shown at *b*), which it uses as a seventh leg when needful. The under side of the head is shown at *c*. It is the larva of a kind of beetle belonging to the family Elateridæ, or, as they are commonly called, the skip-jack or click-beetles, "from the peculiar property which they possess of elevating

themselves when laid upon their backs to a considerable height in the air, by means of an apparatus placed in the breast of the insects, accompanied by powerful muscles, and attended by a sharp clicking sound when this peculiar motion is performed." The beetle of the wireworm is shown of its natural size at *d*, and greatly magnified at *e*. The perfect insects of this family are not injurious, but the larvæ are dreaded by cultivators; and these receive their popular name of wireworm from their very hard external integument, and long cylindrical form. Mr. Mechi holds that salt and water will destroy these pests:—"I have some land subject to this pest, but for several years, having used salt, I have prevented their ravages. 'Oh, but,' say or write many farmers to

FIG. 76.

*The Wireworm in its different states.*

me, 'I have placed wireworms in salt, and they continued as lively as grigs, and therefore it is clear that salt will not kill them.' My reply has been, 'Did you put any water with the salt?' This soon changed their opinion. It wont do to wait for evidence of damage before you apply the salt, for the withering of the plant only takes place after the stem has been bitten through by the wireworm."

In this month the elm trees are frequently infested by a destructive insect called Scolytus. This insect first appears in the bark, the eggs being deposited there by the parent insect, which bores holes in the bark for that purpose. As soon as the grubs are hatched, instinct teaches them to try to reach the cambium or viscid sap which lies between the liber and the young wood, and

on which they feed. To do this they are compelled to make burrows in the bark ; and as the orifices leading to their burrows are left open, that alone is a serious injury to the tree, not only from the exudation of sap from the numerous wounds, but also from the entrance of rain, which by degrees penetrates into the inner bark, and causes a disorganization of the vessels to the extent of several inches, which is indicated, on raising the bark, by a large black patch, moistened by a black fluid ; and on the outside of the bark by several obscure dark-coloured blotches. It is said that these beetles never attack a tree unless it is previously in a state of disease ; but though this may be the case, it is quite evident that the ravages of larvæ, so numerous that above one thousand and thirty were counted in a piece of bark less than eight inches square, would be quite sufficient to occasion the death of the tree, without supposing it to have been previously diseased.

OCTOBER.

General Observations and Directions.

The Weather, &c.—The weather now becomes cold and damp, and the mornings and evenings are often attended with a slight frost. This season is particularly injurious to vegetation, as though moisture, combined with warmth, makes plants grow, or, in other words, develop their cellular tissue rapidly, cold and wet produce a contrary effect, and destroy cellular tissue, or, in other words, make the succulent part of plants damp off. This indeed is the ordinary process of nature, as by an excess of cold moisture the leaves and green part of plants decompose, and are reduced to that state in which their elements are most easily obtained when they are wanted to form the food of other vegetables.

Open Garden.—It is now necessary to prepare half-hardy plants for bearing the cold of winter, and they require to be taken into the house prepared for their reception. As in this month the progress of vegetation is arrested, it is generally chosen for commencing those operations, such as pruning, transplanting, &c., which would be injurious to the tree if the sap were in active motion. It is also the month in which pleasure grounds, shrubberies, and flower gardens are generally laid out and planted.

This is one of the busiest times of the year in the garden, and one of the most pleasant too, for half the joys of gardening are those of anticipation. Indeed, that is one of the chief reasons why gardening is so refreshing as compared with many other pursuits and recreations—there is always something to look forward to; a hope like that of young life, is constantly clinging about it. Who is there that, after trimly planting his roses, fruit trees, evergreens, or lawn trees at this season, does not look forward with keen zest to seeing them grow to beauty and profit under his care? And as this is the season of planting and of hope, so it ought to be that of greatest exertion. Think of doing something at another season,

and it must be put off—now is the time to think of all our contemplated changes, and to carry them out. A few weeks' delay or putting off, and we may lose a year—a great deal in gardening, it need not be said. The present is a good time for planting out spring flowers of any kind. The simplest system is that of filling the beds in summer occupied by geraniums, &c., with masses of double daisies, *Silene pendula*, both white and rose, wallflowers, Sweet Williams, alyssums, iberis, &c.; also with tulips, scillas, crocuses, and other hardy bulbs; but the older way of having rock-work and borders covered with favourite spring flowers must not be neglected, as it is sure to come into vogue again, and be far better developed than hitherto. If there be anything in the way of sub-tropical plants, caladiums, and the like, out of doors, it is high time to have them taken up if the plants are wanted; if not, allow them to die down when the frost comes. Any precious or scarce bedding plants should be taken up now. In the flower garden and its adjuncts protection must soon be given to some half-hardy but desirable plants. Myrtles, for instance, whenever they are grown out against walls in cold parts of the country, will be the better for a mat, though in the south and west, and indeed in most mild parts of the country, they live through most winters on the walls. Fuchsias in several varieties make very charming shrubbery and flower garden bushes, especially the old *globosa*, and in many parts are quite hardy enough to become fully developed shrubs. Where they would be cut down by frost in winter, they may be effectually preserved by tying the shoots pretty close together in a conical form, and wrapping them up comfortably and neatly with straw. Of course this is only necessary where it is wished to have good-sized bushes. They exist without any trouble as herbaceous plants—*i.e.*, die down to the ground annually. Some half-hardy plants, like the fine blue *Salvia patens*, may be effectually protected by placing some inches of coal ashes, cocoa fibre, or other loose material, around the base of the stem and roots. Old tan, leaf mould, &c., will do well. In case of frosty weather coming suddenly, so that it may be desired to take up all tender plants at once, they may be put in sheds in the rough until there is time to trim and pot them, instead of endeavouring to do that off hand. On wet days all such work, and all tying, and arranging of houses and plants for winter, will prove acceptable, and at such employment one may be as profitably engaged as if the weather was of the best.

Wherever chrysanthemums are grown to succeed the bedding plants in the flower garden, they should be brought from the reserve garden at once and planted in the flower beds. Lift them with good balls, and give one thorough watering. In this way they may be removed without the least injury. In root-pruning trees, bear in mind that all the laterally spreading fibres should, as far as possible, be preserved intact, and only the down-rooting, subsoil-feeding ones cut off. All trees and shrubs required for the winter's planting should be selected and ordered at once. Fruit trees, roses, American shrubs, and shrubs and trees of all kinds, may now be removed with the greatest safety. See to the cleaning of walks and drives; if well done they will require little more attention till spring. Lawns should be kept closely mown at this season, for if not they cannot be so well or so easily cut in spring. During the next six weeks every "shining hour" ought to be improved by the judicious horticulturist: all heavy and important diggings and alterations done during that time will take much off the hands and mind in early spring, when many things begin to move that must be attended to with all resources. It is so difficult to carry on garden works when the ground is soaked with wet, and moreover so expensive and unwise in every way, that dry frosty weather should be taken advantage of with all the labour at our disposal. Double the work can be done by men in brisk, dry, or frosty weather than when the ground is sloppy. Of course it is desirable to select those labours that a bad state of the ground most interferes with, such as trenching, manure wheeling, planting trees, &c. Frosty mornings only should be selected for the movement of manures, soils, &c.

In the kitchen garden the planting of cabbages for spring use and for coleworts should be finished. Lettuces of the August sowing should be planted out in some very warm and sheltered spot, free as possible from slugs, and also some put in frames, if there are any to spare for such work, or better still, under the large French bell glasses elsewhere described. Thin winter spinach; this may be done in gathering for use, by pulling up the plants not wanted, and also keep it free from weeds. Endive should be procured in nicely blanched condition just now. Probably the best and handiest way to secure that is to have a few middling sized flower pots, those known as sixteens or twenty-fours, on the endive bed, and place them over the plants most fit for blanching. Then, when a

blanched head is cut, place the pot over a green one, and thus a nice supply may be obtained. Place a little stone or crock over the hole in the apex of the inverted pot. Everybody should grow the *scarolle* or Batavian Endive. It almost blanches itself, and is of fine size and goodly body of white heart. Now is almost the best time to store both Batavian and curled endive, and lettuce at the same time if desired. Take them up either half or fully grown, and plant rather thickly on the floor of peach-house, vinery, or any other cool structure that offers a place to plant it in. Nothing answers better than a turf pit, *i.e.*, a low pit with the walls made of turf, to receive the "lights," either boards or glass, the last the best. In case board or tarpaulin lights are used for this purpose, they must of course be removed during the day on every possible occasion. A little lettuce may be sown to prick out in February, choosing a cool place, of course.

In case cauliflowers are coming in more plentifully than they can be used, some may with advantage be cut off close to the ground, and divested of leaves except a few close to the head. Then they should be fixed in moderately moist earth, in a rather dark shed, where there is means of giving full air; sand would do equally well. They should be plunged to the base of the head, or nearly so, and not put so close together as to touch each other. The heads should be firm when cut, and not inclined to open. Air is necessary to keep the heads from damping. By such means they may be preserved fresh for weeks after they are all destroyed out of doors.

The fruit room should receive full attention just now; there is so much more to be got out of it by taking care to use each kind of fruit at its best, to remove decaying fruit, &c. Fruit gathering also will require to be often attended to. In the case of choice dwarf trees and trees against walls, it is better to gather them as they ripen; but in the case of tall standard trees with a dense crop of fruit, it is better to gather all at once.

Indoor Department.—This month people generally remove their geraniums and bedding stuff from the flower garden. In the London parks they have a fashion of giving away surplus stock to the poor who choose to apply for them—a practice that might be followed out with advantage in private gardens, where the rubbish heap is often covered with geraniums at this time of year. Most people that bed out extensively are obliged to

throw away a lot at this season which may prove a great pleasure to many poor people. Of course people generally keep their variegated kinds, old plants and new, but of the free-growing green sorts there are usually sufficient for next year's stock raised from cuttings. As to keeping geraniums over the winter, nothing can be easier in the case of the ordinary green kinds. The common scarlet may be preserved in great quantity by simply taking them up, cutting off the tops, and shortening in the roots, and then packing them close into shallow, roughly knocked together, wooden boxes, in comparatively dry earth. They keep in that way very well in any sheds or outhouses where there is a little light, and where hard frost may not penetrate—under the shelves or stages in a greenhouse, or any such places—but then in early spring, when the buds begin to elongate, they must be brought well into the light and near the glass to become developed into leafy good plants before May arrives. Geraniums are the chief things we require to preserve now. Of course cuttings will have been struck in most places, but then in the case of rare kinds the old ones must be kept also. Store the variegated geraniums in a somewhat drier, warmer greenhouse than the rarest of the green-leaved ones. It is not too late, but perhaps the best time, to strike the cuttings of calceolarias when the beds are being cleared. On some dry soils the silvery centaurea, so much employed of late years, will live over the winter; but as a rule it is much better and prettier from cuttings planted out every spring. All the greenhouse plants, too, that have been out must be taken in, the houses neatly filled and arranged, and also the pits and frames. For some weeks to come the lights of the frames, &c. containing the hardiest bedding plants may be uncovered on all fine days, and air should be given at all times, day and night. The chrysanthemums will now be coming into bloom, and those in pots must be attended to with plenty of water, and in every other way. Wherever there is a large conservatory, or one with beds, it is a good plan to grow a little nursery of good kinds of chrysanthemums, and at this time of year, or a little earlier, take them up and plant them in the conservatory borders, taking them out again when out of bloom. Those who wish to save the labour of growing chrysanthemums in pots the whole year round, may do so, and still enjoy them in the greenhouse, by having them nicely grown in a very rich moist spot in the open ground, and taken up and potted on some moist

October day, giving a thorough soaking of water immediately afterwards, and keeping them in the shade for a few days. Plants treated in this way will be found to bloom strongly and beautifully. If you wish to enjoy the best potted kinds, you should have them protected, and in positions calculated to allow of the full development of the flowers. Soakings of well diluted liquid manure are always acceptable to the gross-feeding chrysanthemum. Where forcing flowers is carried on, such things as azaleas, lily of the valley, dielytra, lilac, roses, &c., should be gradually introduced to a genial temperature and a nice light moist house, heated, say, to about 60°, which temperature would of course be allowed to rise higher with sun heat. The plants should be syringed frequently, and, above all things, kept perfectly clean, and so near the light that they will not be "drawn"—i.e., attenuated in rising to the light. Of course hyacinths, &c., will be placed under like conditions if their flowering is desired early. Strawberries in pots for early forcing should now be protected from heavy rains, and also from severe frost, which, though it would not hurt the strawberries, would be pretty sure to burst and break the pots. If there be sufficient room, placing them in cold frames and pushing on the lights or shutters during frost or heavy rain, leaving them off at all other times, will prove a capital plan. Some cultivators build them up potato-pit fashion, by placing them on their sides and putting layers of coal ashes between. Prepare for forcing rhubarb and seakale. Keep the atmosphere of houses in which grapes are hanging dry, to prevent decay, but not too dry. A little fire heat in very moist weather, and judicious airing on all fine days, are all that is required. If small salads are required, they are best sown in cold frames at present, though the glass need only be on in bad weather; but they may be raised anywhere indoors without much trouble.

Things not to be done in October.

In placing plants on the stage in the greenhouse, never mix them indiscriminately; but place the soft-wooded and hard-wooded separately; also those which require much water apart from those which require but little.

Never plant a tree or shrub deeper than the collar.

Never place manure in direct contact with bulbs or roots of any kind.

Never plant choice trees and shrubs in a shrubbery nearer to each other than where they would be supposed to touch in a certain number of years—say from six to ten—and fill up the intermediate spaces with common plants. It is thick planting which causes so many shrubberies containing really rare and good plants to look so unsightly as they often do. People have a dislike to remove any of them; whereas if there were common plants between, they would be removed when necessary without scruple.

Never plant permanent shrubs nearer to walks than they would reach when full grown, unless intended for a hedge, and then they should be planted at a distance sufficient to allow them to make plenty of wood for several years.

Never allow choice tender plants to remain out fully exposed to the weather later than the first week in this month; if the greenhouse is not ready for them, they should be placed in a pit where the lights can be placed over them during heavy rains and cold nights.

In clearing the flower-garden of its summer occupants, never throw the numerous spare pelargoniums, and other plants on the rubbish heap, but give them away to the many poor cottagers and others who will be delighted to get them for their gardens and windows.

Principal Operations in October.

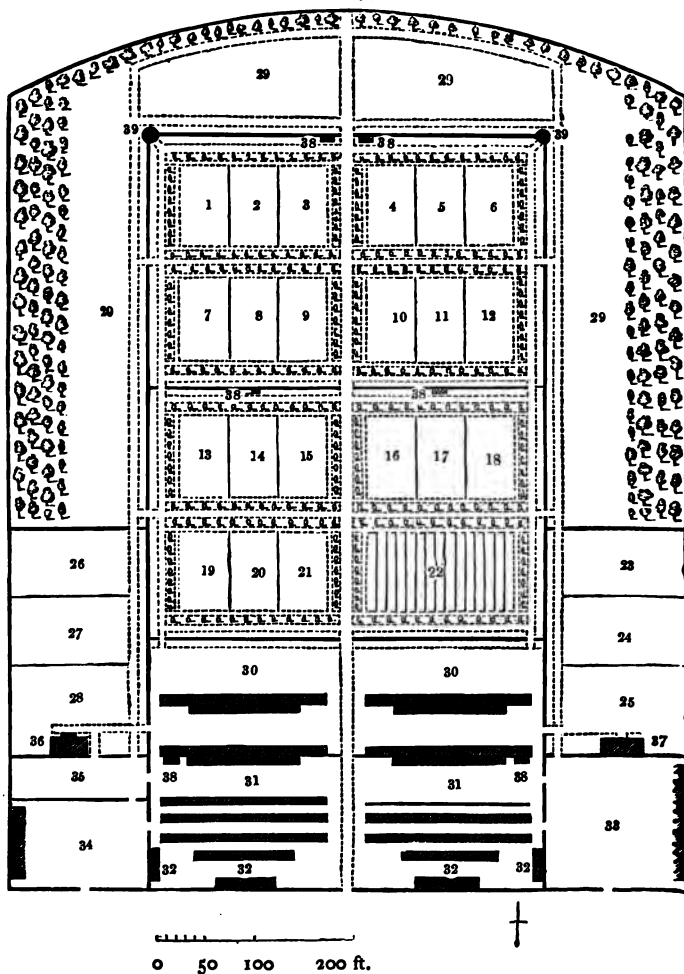
Laying out a Kitchen and Fruit Garden.—When a new kitchen garden is to be formed, it should be laid out in this month; and, even in the smallest places, it is much better to have the portion of ground devoted to culinary vegetables quite distinct from the flower garden. Where the kitchen garden is quite separate, the situation should be open, airy, and not surrounded by trees, and it should lie open, if possible, to the south. It should also be as near the kitchen and stables as can be managed: the size must vary according to circumstances, but is generally from one to five acres. The form should be either square or oblong; for the convenience of having the compartments in an oblong shape, as if they are round, or even curved, a great deal of space must be lost, as it

would be difficult to grow peas and beans, and, indeed, most other vegetables, otherwise than in straight lines. The surface of the ground should be level or sloping to the south, and the best soil is a sandy loam.

As soon as a proper situation has been fixed upon, and the ground levelled and thoroughly drained, it should be divided into three or four portions, varying in size according to circumstances. Supposing the ground to be divided into three portions, one should be set aside for the culinary vegetables, another for the forcing-houses, and a third for those permanent crops, such as artichokes, rhubarb, &c., which are generally found in kitchen gardens. Where the ground is divided into four parts, the fourth part is generally set aside for the cultivation of standard fruit trees, which are either placed in an orchard by themselves, or in what are called slips on the outside of the garden walls. It is a great point to be attended to, to have no vegetables grown in the borders close to the walls, to avoid disturbing the roots of the wall-fruit trees; and another equally essential point to be attended to is, to have no fruit trees in the compartments devoted to culinary vegetables; as the incessant stirring of the ground, which is necessary for the annual crops, obliges the fruit trees to send their roots down far into the soil, and whenever the roots are beyond the reach of atmospheric air, they are apt to produce leaves and branches instead of fruit. The fruit trees in a kitchen-garden should be either trained against the walls, or planted as espaliers, leaving the central compartment entirely for the culinary vegetables, and all standard trees should be planted in the slips outside, or in an orchard. The ground need not be unoccupied beneath them, as the London market gardeners cultivate rhubarb and various other crops with perfect success beneath their orchard trees.

To give an idea of the general arrangement of a kitchen garden, I shall give one on rather a large scale, which contains everything that can be required, and which can be only partially adopted, or have all its proportions diminished or enlarged, according to circumstances. Fig. 77 shows a kitchen garden containing four acres within the walls, and five acres in the slips. In this plan the compartments from 1 to 21 are intended for culinary vegetables, the details respecting which will be given hereafter, when speaking of planting the kitchen garden; 22 is a bed, divided into trenches, for celery and sea-kale; 23 is a bed for artichokes; 24 one for rhu-

FIG. 77.

*Plan of a Kitchen Garden.*

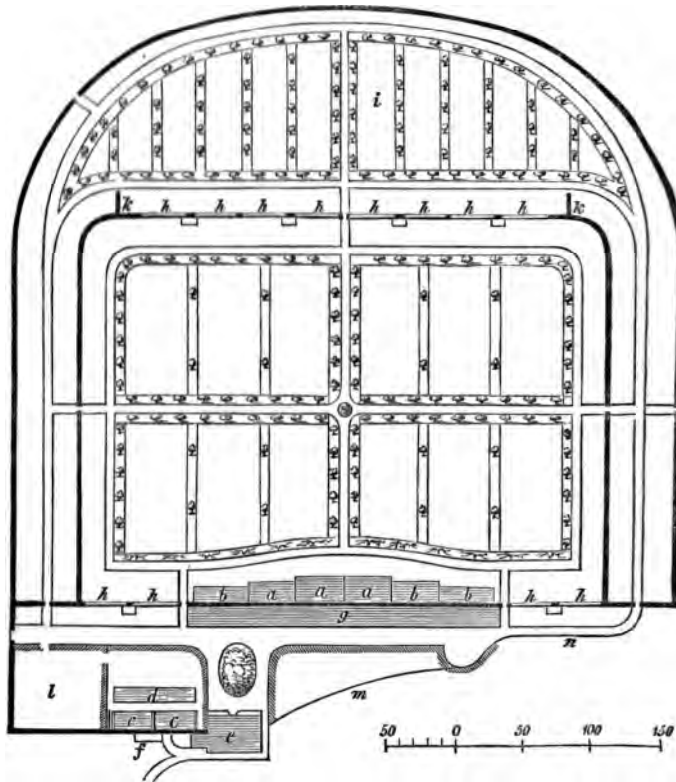
barb; and 25 one for asparagus; all of which come under the denomination of permanent crops, as do the three beds on the opposite side, viz. 26, for Jerusalem artichokes; 27 for horse-radish; and 28, for kitchen herbs, such as sage, mint, and thyme. The two beds at the farther end, marked 29, are set aside for strawberry-beds, gooseberries and currants, and raspberries; and the two slips marked 29 are planted with standard fruit trees and raspberries. 30 is the forcing department, and it contains vineries, peach-houses, &c. 31 is the frame ground, with a dwarf wall for training, and five ranges of frames for cucumbers, melons, &c., and two pits. 32, 32 are sheds for mushrooms, tool-houses, &c. 33 is the reserve ground or place for mixing and turning over manure, &c., with an open shed; 34 is the compost department; 35 is the yard belonging to the gardener's house, and 36 is the gardener's house. 37 is a building devoted to fruit, onion, and seed rooms, with a lodging room over. At 38 are water tanks; and at 39 circular ornamental buildings for the garden labourers to take their meals or lodge in. The inner part of the garden is surrounded by fruit walls, and each bed, consisting of three compartments, is surrounded by trees, which may be either gooseberries and currants, or espaliers.

As this garden is of very large size, I have thought it advisable to give another, which is much smaller, and which, perhaps, may be found more convenient for general purposes. Fig. 78 shows the kitchen garden at Erskine House, Renfrewshire, in which *a a a* are vineries; *b b b*, peach houses; *c c*, pine pits; *d*, a melon pit; *e*, the gardener's house; *f*, offices; *g*, sheds; *h h*, hot walls; *i*, orchard; *k k*, short screen walls; and *l*, rubbish corner. In this garden there are comparatively few compartments for the culinary vegetables; but the four beds into which the centre is divided may be subdivided as required, and the whole is surrounded by gooseberry and currant bushes. There is a pond in the centre, and the wall in front of the hothouses is planted with espalier pear trees.

The walks in a kitchen garden should all be straight, and of a sufficient width to allow a wheelbarrow to pass up them without touching the plants on either side. Paths two feet wide should always be made between the beds into which the compartments are divided; and the beds themselves should never be wider than a man can conveniently reach across to rake. Four feet is indeed the general width of beds intended for culinary vegetables. As

there is occasion frequently to wheel a barrow containing **manure** or other heavy substances along the walks of a kitchen garden, it is

FIG. 78.



Plan of the Kitchen Garden at Erskine House.

necessary that the walks should be of some very firm material, or they will be ploughed into very unsightly furrows with the wheel of the barrow; and hence asphalte, or some kind of cement, is

generally preferable to gravel. Sometimes bricks, stones, or pebbles are used, or in short any substance which can be readily procured, and which is of a sufficiently durable nature. Directions for making gravel walks have been already given, and a somewhat similar preparation is necessary to make a foundation for walks of a more durable description.

Planting Fruit Trees.—This is the best season for planting fruit trees. When fruit trees are to be planted against the walls, the first point to be considered is to prepare a border for them; as on this, more than anything else, their future well-doing depends. The border is generally about ten or twelve feet in width, and, if it is wished to have the fruit in perfection, nothing should be planted on it, it should be kept entirely for the fruit trees. It was formerly the custom to make the border for wall-fruit trees very deep, and to manure it; but this is found to be a bad plan, as it induces the trees to make more wood and leaves than fruit, besides which, when the trees grow too luxuriantly they produce more wood than they can ripen. To have fruit-bearing trees it is essential to keep the roots within the reach of the atmospheric air; and for this purpose the border for wall-fruit trees should always have a hard bottom with only about a spade deep, or from fifteen to eighteen inches of soil upon it. When the subsoil is rocky this is easily obtained; but when it is not, the ground should be excavated to the depth of eighteen inches or two feet, and, the bottom of the excavation having been made level, it should be covered with a layer of tiles or slate. On this is placed the soil in which the plants are to grow, and which should never be more than eighteen inches deep. It should be remarked, however, that where there is a good gravel subsoil, these precautions are not necessary. The best soil for peaches and nectarines, and indeed for all the finer kinds of wall-fruit trees, is turf taken from the surface of any old pasture where the soil is loamy, and chopped up with a spade into pieces about four inches in diameter. If turf cannot be procured, mortar rubbish, rotten wood, charcoal, or any light loose material, with the exception of coal ashes, may be mixed with the soil, so as to keep the earth loose.

As soon as the border is properly prepared, the trees should be taken up carefully, so as to preserve their spongioses as much as possible, and placed properly against the wall, spreading the roots carefully over the surface of the border, and covering them with

soil only three inches deep. Peach and nectarine trees are generally planted against a south or south-east wall; and dwarf trees are planted about twenty feet apart on a wall eight or ten feet high. As this is a considerable distance when the trees are young, it is customary to put plum or pear trees grafted standard high between the dwarf peaches and nectarines. Winter pears should always be planted against the warmest walls of the garden. The practice of planting our fine varieties of winter pears away from walls is most disastrous. The amateur should confine himself to a few good varieties only, say Glou Morceau, Easter Beurre, Beurre Bosc, Josephine de Malines, Beurre Rance, and Bergamotte Esperen, and plant them against south walls. The summer and early autumn pears will do in the open.

Apricot trees are best placed on an east or west wall, as too much heat is injurious to them, and occasions the blossoms frequently to drop off at the time of setting. "This is not to be wondered at," observes an able writer, "when it is considered that the ground is at that time (March) in as cold a state as at any period of the whole season; neither the sun's heat nor the warm rains having reached so far below the surface as to warm the soil in contact with the roots: and thus, while the latter are in a medium perhaps a little above freezing, the top of the tree, exposed to a bright sun against a wall, is occasionally in a temperature as high as 90° or 100° of Fahrenheit." Apricots are planted from fifteen to twenty-five feet apart according to the kind, the early sorts being less spreading, and consequently occupying less space on the wall. Figs are generally grown on a south or south-east wall, and they should be planted twenty-five or thirty feet asunder, as they spread to a great distance, and bear on the points of their shoots. Plums are generally planted from fifteen to twenty feet apart, except the Washington, which, being a strong-growing plant, requires four-and-twenty feet. Cherries and pears may be planted about twenty feet apart. Vines may occasionally be planted against a wall, though they seldom succeed well in the open air. The best kinds are the Chasselas de Fontainbleau, Esperione, the White Sweetwater, and the Cambridge Botanic Garden Grape. Plantations of raspberries may be made at this season: the situation chosen should be on the north side of the garden, and if it is near water it will be the better, as raspberries never thrive without abundance of moisture. The outside suckers are reckoned the best, and they should be at least two feet high;

but it will be better if they are three or four feet. When they are dug up, care should be taken to retain as many of the fibrous roots as possible; and, in planting, these should be carefully retained, while any hard woody part in the root should be cut away. The plants should be about three or four feet apart in the row, and the rows four feet asunder.

SELECTION OF THE BEST HARDY FRUITS.—It is of great importance that amateurs should know the names of the kinds of hardy fruit that do best throughout the country generally. The following may be depended on:—

Pears: Jersey Gratioli, Doyenne du Comice, Jargonelle, Williams's Bon Chretien, Aston Town, Beurre de Capiaumont, Louise Bonne of Jersey, Suffolk Thorn, Thompson's Pear, Beurre d'Amanlis, Swan's Egg, Croft Castle, Doyenne d'Ete, Comte de Lamy, Knight's Monarch, Althorpe Crassane, Marie Louise, and Beurre Superfin.

Apples: Borovitsky, Early Harvest, Irish Peach, Joanneting, Summer Golden Pippin, Lord Suffield, Keswick Codlin, Adams's Pearmain, Blenheim Pippin, Cox's Orange Pippin, Early Nonpareil, Golden Pippin, Ribston Pippin, Sykehouse Russet, Bedfordshire Foundling, Hawthornden, Yorkshire Greening, Golden Noble, Court Pendu Plat, Golden Harvey, Sam Young, Sturmer Pippin, Beauty of Kent, Dumelow's Seedling, Royal Pearmain, Tower of Glammis, and Pitmaston Nonpareil.

Peaches: Early Grosse Mignonne, Early York, Grosse Mignonne, Royal George, Bellegarde, and Barrington.

Plums: Pond's Seedling, Early Rivers, Orleans, Gisborne's, Victoria, Prince Engelbert, and Damson.

Cherries: May Duke, Early Prolific, Bigarreau, Late Duke, Knight's Early Black, Belle Agathe, Rival, and Mammoth.

Apricots (for standard trees in the southern counties): Breda, Brussels, Turkey, and Moorpark.

Figs: These would be better grown as shrubs, with low sweeping branches, and buried in the ground in winter to save them from the frosts, as the French do about Argenteuil. Black Ischia, Brown Ischia, Brown Turkey, and Courcourcelle Blanche.

Medlars: The Nottingham is the best kind.

Nuts: Lambert's Filbert (Kentish cob) is the best; Purple Filbert, Pearson's Prolific, and Cosford also good.

Of the *Quinces* the Portugal is the best. The Berberry is rarely

cultivated, though worth that trouble. The stoneless variety is the best.

Almonds: Common Sweet, Large Fruited Sweet, and Tender Shelled.

Walnuts: Dwarf Prolific, Highflyer, and Large Fruited.

Raspberries: Autumn Black, Carter's Prolific, Fastolf, October Red, October Yellow, Rogers' Victoria, Round Antwerp, Sweet and Yellow Antwerp.

Gooseberries: Red Champagne, Red Warrington, Gipsy Queen, Yellow Champagne, Green Walnut, Pitmaston Green Gage, White Champagne, Conquering Hero, and Stockwell.

Currants: Black Naples, Ogden's Black, Cherry, Knight's Large Red, Long-bunched Red, Raby Castle, Red Dutch, and White Dutch.

Strawberries: Black Prince, Keen's Seedling, British Queen, Sir Charles Napier, Vicomtesse Hericart de Thury, Frogmore Late Pine, and Eclipse.

FIG. 79.



The Apple trained as a Simple Horizontal Cordon, grafted on the French Paradise Stock, and in full bearing.

THE CORDON SYSTEM OF APPLE GROWING.—Whatever may be the merits of this system as applied to other fruits, it is most certain that the cultivation of the apple as a horizontal cordon grafted on the true French paradise stock is one of the most pleasant and profitable things that can occupy the attention of the amateur gardener. The following description of it is from *The Parks, Promenades, and Gardens of Paris*, and the figures will serve to put it fairly before the reader. As it is purely a continental plan, and has not up to the present time been illustrated in our gardens, nobody should be deterred from attempting it because they may not find good examples of it in their immediate neighbourhood.

The first thing we have to settle is, what is a cordon? There has been some little discussion on this point—discussion that was utterly needless, and even mischievous, as tending to prevent the public

knowing exactly what the term is used for. It simply means a tree confined to a single stem; that stem being furnished with spurs, or sometimes with little fruiting branches nailed in, as in the case of the peach when trained to one stem. Some contended that it meant any form of branch closely spurred in; but this is quite erroneous. The term is never applied to any form of tree but the small and simple stemmed ones. The French have no more need of the word to express a tree trained on the spur system than we have, and they have trained trees on that system for ages without ever calling them by this name.

A simple galvanized wire is attached to a strong oak post or bit of iron, so firmly fixed that the strain of the wire may not disturb it. The wire is supported at a distance of one foot from the ground, and tightened by one of the handy little implements known as *raidisseurs*. This *raidisseur* will tighten several hundred feet of the

FIG. 80.

*The Bilateral Cordon.*

wire, which need not be thicker than strong twine, and of the same sort as that recommended for walls and espaliers. The galvanized wire known as No. 14 is the most suitable for general use. At intervals a support is placed under the wire in the form of a bit of slender iron with an eye in it, and on this the apple on the French paradise is trained, thus forming the simplest and best and commonest phase of the cordon system. This is the kind best suited for making edgings around the squares in kitchen gardens, &c.

Cordons are trained against walls, espaliers, and in many ways, but the most popular form of all and the best and most useful, is the little line of apple trees acting as an edging to the quarters in the kitchen and fruit garden. By selecting good kinds and training them in this way, abundance of the finest apples may be grown without having any of the large apple trees or those of any other form in the garden to shade or occupy its surface. The bilateral

cordon is useful for the same purposes as the simple one, and especially adapted to the bottoms of walls, bare spaces between the fruit trees, the fronts of pits, or any low naked wall with a warm exposure. As in many cases the lower parts of walls in gardens are quite naked, this form of cordon offers an opportunity for covering them with what will yield a certain and valuable return. It is by this method that the finest-coloured and best French and American apples, sold in Covent Garden and in the Paris fruit shops at such high prices are grown. I have seen them this year in Covent Garden and in Regent Street marked two and three shillings each, and M. Lepere fils, of Montreuil, told me during the past summer that they have there obtained four francs each for the best fruit of the Calville to send to St. Petersburg, where they are

FIG. 81.



The Cordon on low sunny wall of plant-house. In this way Calville Blanc, Reinette du Canada, the Lady Apple, the Melon, Mother, Newtown Pippin, and all the finer and tenderer French, American, and British apples may be grown to perfection.

sold in winter for as much as eight francs each! Why should we have to buy these from the French at such a high rate? Considering the enormous number of walled gardens there are in this country, there can be no doubt whatever that by merely covering, by means of this plan, the lower parts of walls now entirely naked and useless, we could supply half a dozen markets like Covent Garden with the very choice fruit referred to, and be entirely independent of the French.

Doubtless many think that these very fine fruit require a warmer climate than we have for them. But by treating them as the French do we may produce as good or a better result, and may, in

addition, grow tender but fine apples, like the Calville Blanc, that do little good when grown as standards. The climate in most parts of England will be found to suit them quite as well as that of Paris, if not better, because the sun in France is in some parts a little too strong for the perfect development of the flesh and flavour of the apple. There is no part of the country in which the low cordon will not be found a most useful addition to the garden—that is, wherever first-rate and handsome dessert fruit is a want. So great is the demand in the markets for fruit of the highest quality that sometimes the little trees more than pay for themselves the first year after being planted. In any northern exposed and cold places where choice apples do not ripen well it would be desirable to give the trees as warm and sunny a position as possible, while the form recommended for walls should be used extensively. In no case should the system be tried except as a garden one—an improved method of orcharding being what we want for kitchen fruit, and that for the supply of the markets at a cheap rate.

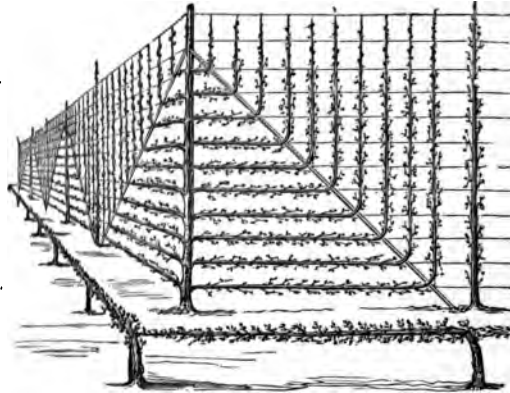
When lines of cordons are perfectly well furnished the whole line is a thick mass of bold spurs. Some keep them very closely pinched in to the rod, but the best I have ever seen were allowed a rather free development of spurs, care being taken that they were regularly and densely produced along the stem. If anybody will reflect that as a rule the best vigour of the ordinary espalier tree flows to its upper line of branches, he will have no difficulty in seeing at a glance the advantages of the horizontal cordon, particularly if he bears in mind that the system as generally applied to the apple is simply a bringing of one good branch near the earth, where it receives more heat, where it causes no injurious shade, and where it may be protected with the greatest efficiency and the least amount of trouble. It is just a carrying further of the best principles of grafting and pruning—a wise bending of the young tree to the conditions that best suit it in our northern climate. The fact that by its means we bring all the fruit and leaves to within ten inches or a foot of the ground, and thereby expose them to an increase of heat, which compensates to a great extent for a bad climate, will surely prove a strong argument in its favour to every intelligent person.

The form is so definite and so simple that anybody may attend to it, and direct the energies of the little trees to a perfect end, with much less trouble than is requisite to form a presentable pyramid or

bush. It does not, like other forms, shade anything, and beneath the very line of cordons you may have a slight crop. They are less trouble to support than either pyramid or bush; always under the eye for thinning, stopping, &c.; easy of protection, if that be desired; and very cheap in the first instance.

A few words are necessary as to the best method of planting and managing the apple trained and planted around the quarters or on borders. In a garden in which particular neatness is desirable it would be better to plant them within whatever edging was used for the walks, but in the rough kitchen or fruit garden they may be used as edgings. The reason of supporting the cordon at one

FIG. 82.



Edgings of Cordons in French fruit garden. These are three years old. When older, if well managed, they ought to regularly present a wider array of spurs.

foot from the surface is to prevent the fruit getting soiled by earthy splashings. By having something planted underneath which would prevent this, we might bring the cordon lower down; but, though I have thought of several things likely to do this, none of them are very satisfactory. Doubtless, however, we shall yet find something that may be cultivated with profit immediately under the cordon and prevent the splashings, and then be able to bring it within six inches of the earth.

As regards the planting and treatment of the apple trained in this form some remarks are necessary. In planting keep the union of stock and scion just above the surface of the ground, to prevent the apple grafted on the Paradise emitting its own roots, and consequently becoming useless for such a mode of training. The trees should never be affixed down to wire or wall immediately after being planted; but allowed to grow erect during the winter months, and until the sap is moving in them, when they may be tied down. Some allow them to grow erect a year in position before tying them down. They should in all cases be allowed to settle well into the ground before being tied to anything. For general planting the best and cheapest kinds of plants to get are those known as "maidens," *i.e.*, erect growing trees about a year from the bud or graft. These can be readily trained down to the wire, or to the wall, in spring. In training the young tree the point with its growing young shoot of the current year should always be allowed to grow somewhat erect, so that the sap will flow equably through the plant, drawn on by the rising shoot at its end. To allow gross shoots to arise at any other parts of the tree is to spoil any prospect of success. If the tree does not break regularly into buds, it must be forced to improve by making incisions before dormant eyes.

A chief point is not to pinch too closely or too soon. The first stopping of the year is the most important one, and the first shoots should not be cut in immediately; but when the wood at their base is a little firm, so that the lower eyes at the bases of the leaves may not break when the shoot is checked. Pinch at five or six leaves, as the object is not to have a mere stick for the cordon, but a dense bushy array of fruit spurs quite a foot or more in diameter, when the leaves are on in summer. All the after pinching of the year may be shorter, and as the object is to regularly furnish the line, the observant trainer will vary his tactics to secure that end—in one place he will have to repress vigour, in another encourage it. About three general stoppings during the summer will suffice, but at all times when a strong soft "water shoot" shows itself well above the mass of fruitful ones it should be pinched in, though not too closely. I have even in nurseries seen things called "cordons" with every shoot allowed to rise up like a willow wand—utterly neglected and on the wrong stock, and I have in other cases seen them so pinched in as to be worthless sticks. Of course success could not be expected under the circumstances, and

Single and Double Cordons in French Fruit-garden.



FIG. 83.

I must caution the public against taking such things as examples, or the opinions of their managers as to the merits of the cordon system.

As the Paradise keeps its roots quite near the surface of the ground, spreading an inch or two of half decomposed manure over the garden, or in gardening language mulching it, could not fail to be beneficial. A full account of the cordon system as applied to other trees will be found in the "*Parks, Promenades, and Gardens of Paris*," from which the above is taken. The wire and implements necessary for making the supports of these cordons, and also for erecting the neat, permanent, and cheap trellises shown in the last engraving, may be had from MM. J. B. Brown and Co., of 90, Cannon-street, E.C., and are described and figured in the catalogue of that firm.

The varieties of apples to be grown on the cordon system should be most carefully chosen. As the system is chiefly valuable for the production of superb dessert fruit, only the finest kinds should be selected; but as some apples are of high value both for kitchen and dessert, some of the finer kitchen apples are included in the subjoined list. The following will be found very suitable: Reinette du Canada, Reinette du Canada Grise, Reinette Grise, Reinette de Caux, Reinette d'Espagne, Reinette très Tardive, Belle Dubois, Pomme d'Api, Mela Carla, Calville St. Sauveur, Coe's Golden Drops, Newtown Pippin, Calville Blanc, Northern Spy, The Melon, Cox's Orange Pippin,

Duke of Devonshire, Kerry Pippin, Lodgemore Nonpareil, White Nonpareil, The Mother, Early Harvest, Lord Burleigh, Beauty of Kent, Bedfordshire Foundling, Lord Suffield, Cox's Pomona, Hawthornden, Tower of Glammis, Winter Hawthornden, Betty Geeson, and Small's Admirable. Some of the best of the above are valuable keeping apples. I saw the Reinette Grise in fine condition in the markets at Rouen in June, 1869, and Reinette très Tardive is good in July. Those who wish to plant good early apples might try Borovitsky, and a few of the best early kinds; but it is best to devote most of our horizontal cordons to the growth of the finer, later, and most valuable fruits. Of the above selection Calville Blanc, Reinette du Canada, and Mela Carla, must be grown on a warm wall; Newtown Pippin, The Mother, Melon, and several of the other later and finer apples will also be grateful for the same protection.

Hyacinths and their Culture.—At this season people usually think of obtaining and planting bulbs, and as few amateurs do not admire and cultivate them to some slight extent, a few general observations on the subject are necessary. The hyacinth is the most important of all, and its culture, like that of most bulbs, is very simple with ordinary precaution. Out of doors the best time to plant is the last half of the present month, or the first half of the next. "When grown out of doors, the bulbs should be put in the ground late in October or early in November. The crown of the bulb should be placed four inches below the surface of the soil, and two or three inches of litter or manure should be strewed thereon as a protection against frost. The litter may be removed early in spring, as soon as the leaves have pushed fairly through the earth. It may be placed on again at night during frosty weather. A sandy loam is the soil in which these bulbs seem to grow and flower best, and if such is not the natural soil of the spot they are intended to occupy and adorn, it is well worth while to provide such as an artificial soil. If during the season of flowering a slight shading be provided, the quality and durability of the flowers will be increased. Hyacinths out of doors seldom require water, as the soil is sufficiently moist in their season of growth and flowering. When the flowering is over, and the leaves show signs of decay, the bulbs may be taken up and laid by for a fortnight, embedded in the surface soil, after which time they may be gathered up, deprived of their roots and leaves, and placed away in a cool dry shed or store-

house. This, as we have before said, may, from varying circumstances, be desirable, but is not absolutely necessary.

"The indoor culture of the hyacinth in pots, rustic baskets, bowls, and glasses, is largely carried out in this country. Indeed, our conservatories and halls would be shorn of their brightest and sweetest floral embellishments in winter and early spring were the hyacinth and the tulip withheld. Hyacinths potted in September may be brought into good condition of bloom before Christmas; and by potting fresh bulbs at intervals of a fortnight till the end of the year, a succession of flowers may be obtained till the middle or end of April, when other flowers will be bursting upon us from every nook and cranny of the well stored plant house. The best soil for hyacinths in pots is also sandy loam, enriched by the usual cool and solid fertilizers. Of these, decayed cowdung is excellent. Guano I have heard recommended under this head, and I am not sure that I have not in former times included it among permissible fertilizers. My later experience, however, is not in accordance with this view, as I have found it develop the leaf rather than the flower. When placing the bulb in the pot, the crown or apex should be just above the soil. The pots should be placed on the level soil, out of doors, and surrounded and covered over with a thick layer, say six inches, of cinder ashes, as an efficient protection against frost. They should not be left more than two months in this position, by which time the leaves and flower spikes will be pushing into life. Remove them then to a cold pit, greenhouse, or forcing house, according to the date at which they are wanted to flower. Deluge the soil with water, which repeat at intervals till the flowers are on the wane. Place the plants close to the glass, and admit abundance of air, that the leaves may not be developed out of proportion. It may be well to bear in mind that the long slatternly leaves and attenuated stems sometimes met with in hyacinths are due to the want of air and light. It is, however, necessary to say that the hyacinth, however skilfully grown, requires an artificial support for the flower stem, owing to the succulent and supple nature of the latter. For this purpose a piece of wire bent zigzag fashion is the best contrivance I have hitherto been able to apply. Hyacinths, under our system of cultivation, do not succeed a second year in pots or glasses, but if planted out of doors when taken from the pots or glasses, they become highly decorative in the future of the flower garden.

"The cultivation of hyacinths in glasses is a delightful recreation, and so accessible to rich and poor, young and old, and fraught with so many pleasing incidents and associations, that I am not surprised to find this beautiful branch of indoor gardening very generally practised. Nothing is easier than to grow good hyacinths in glasses, provided the cultivator possesses himself of good sound bulbs. Size is not always evidence of quality. Weight furnishes a more reliable test. To know the conditions and method of previous culture are, however, the most satisfactory means of arriving at correct conclusions on this head. That these points are worthy of attention will be apparent when we state that there is a difference of nearly fifty per cent. in the quality and marketable value of the bulbs annually imported.

"Nothing can be more interesting than to watch the development of root, and leaf, and flower, during the growth of hyacinths in glasses. The springing up of the leaves in winter, when the vegetable world without is in a state of rest, is a refreshing harbinger of returning spring. The rapid rise of the flower spike is hardly a trial of patience to the least patient, and the flush of blossoms places in his hands a chaste and finished object of beauty.

"I shall conclude this paper with a few short simple rules relating to hyacinths grown in glasses. These rules may be learnt in five minutes, and if followed will, I am persuaded, be attended with satisfactory results.

"1. If you choose your own bulbs, look for weight as well as size; be sure also that the base of the bulb is sound. 2. Use the single kinds only, because they are earlier, hardier, and generally preferable for glasses. 3. Set the bulb in the glass so that the lower end is almost, but not quite, in contact with the water. 4. Use rain or pond water. 5. Do not change the water, but keep a small lump of charcoal at the bottom of the glass. 6. Fill up the glasses with water as the level sinks by the feeding of the roots and by evaporation. 7. When the bulb is placed, put the glass in a cool dark cupboard, or in any place where light is excluded, there to remain for about six weeks, as the roots feed more freely in the dark. 8. When the roots are freely developed, and the flower spike is pushing into life (which will be in about six weeks) remove by degrees to full light and air. 9. The more light and air given from the time the flowers show colour the shorter will be the

leaves and spike, and the brighter the colours of the flowers."—*Mr. William Paul's Lecture on the Hyacinth.*

Hardy bulbs.—People lose a good deal by neglecting the finer varieties of hardy bulbs in their gardens. "Crocus vernus, both the yellow and the grey," as Lord Bacon says in his celebrated essay on gardens, are too well known to require mention here, but even these are not seen so plentiful as they ought to be round shrubby margins and semi-wild places. They are beautiful alone, but how very lovely and striking when mixed with such exquisitely striped kinds as Sir W. Scott, La Majestueuse, Albion, and several others of the striped violet and white kinds! Some of the flowers of these surpass in beauty almost any other spring flower, and their effect when used as edgings to beds is beyond that afforded by any other plants. Of one thing there need be no doubt, and that is, that these charming hardy flowers should be represented in every garden. As to their culture, it is as simple as that of the daisy. Of course it does best in rich, deep, and light soils. Plant pretty deep, say five or six inches. In some places, mice, &c., play havoc with the crocus, and this deep and regular planting may tend to keep the bulb out of harm's way. We have heard of ground glass being mixed with some free soil, and laid in a thin layer half way between the roots and the surface, and acting as a good preventive against mice. "Crocuses and snowdrops," we cannot put them apart, and whatever suits one will suit the other. Almost everybody who has a particle of taste in gardening grows them; but how few make those nice little mixtures of snowdrops and the finer crocuses and scillas that are so charming. What is to prevent us having the Siberian squill, the snowdrop, the delicately marked varieties of crocus, *Triteleia uniflora* and *Bulbocodium vernum*, all mixed nicely in small beds in a sunny and sheltered position? Such mixture would exhibit a rare beauty in spring. There is another kind of snowdrop of much beauty—the Crimean (*Galanthus plicatus*). It is a noble spring flower, quite as easy to grow as the common one. One most tasteful mode of employing the common snowdrop is to plant it on grass lawns and green spots here and there, or green spots round the margins of shrubberies, which need not be sown very early in spring, at least not till the grass gets very long. The snowdrops peep, flower, and fade early, have completed a sufficient growth by the time the grass is mown, and will thus furnish a simple charm year after year, without requiring any

trouble, labour, or expense after the first planting. The best way is to dib in the roots with a pointed stick, put in a good root, then fill up the hole with a little fine soil to about the level, and then press the place with the foot. The roots will increase and be a lasting source of pleasure. We would prefer this kind of arrangement on those wide green margins near winding walks and shrubbery margins in almost every garden, but there is no reason whatever why they should not crop up here and there on the lawn or in any other grassy place. As in many places snowdrops are plentiful, the expense would not be worth speaking about; and even if we had to buy them, they are not quite so dear as the tulip, for a single root of which the daft Dutchmen used to give away their carriages and horses in the days of the celebrated mania.

The bluebell, or wood hyacinth of our woods, has many pretty congeners, and not a few pretty varieties, white and pink. We know some people are fanatical enough to collect these bluebells and plant them in their woods and shrubberies, but it is certainly a very pardonable species of fanaticism. It is done at Cliveden on some grassy shady slopes, though the plant is abundant enough in the woods about. The effect of the densely-planted, sloping green banks shot with nodding blue, and toned down to the point of fascination by thousands of grass blades and wood anemone leaves, is exquisite. Perhaps the most distinct from the wood squill of all its congeners is the Siberian squill (*Scilla sibirica*), one of the most beautiful of all spring flowers—as hardy as the mountain fern, and almost as surprisingly and beautifully blue as the Bavarian gentian, which is saying a great deal. It should be in every garden, and in such a position that it need not be disturbed much, or run any risk of being exterminated in digging. Another fine squill is *S. bifolia*, and more in want of commendation from us than of any of the others, because it is very little known even to the best gardeners and nurserymen. But it is quite as well worthy of a place as the Siberian squill, and increases more freely than that. It is quite distinct in colour too, being of a deep dark blue, and flowers well and regularly. Then there is *S. campanulata*, and its white variety *S. c. alba*, both fine things for the mixed border, or for peeping here and there from the margins of shrubberies. So too is *S. hyacinthoides*, a strong and free bloomer, in the way of the last. *Scilla amœna* is a distinct species, useful to those who care to have

a good collection of spring flowers; *S. rosea* and *S. italica* are also pretty dwarf kinds, and there are many others which we could enumerate, but the public taste is not yet ripe for much variety beyond those we have named. Of the various other hardy spring bulbs which merit the attention of the amateur, daffodils, tulips in great variety, lilies, anemones, may be named, and lists of good kinds of each family may be found in the bulb catalogues of most of our seedsmen. Every one of these hardy bulbs is quite easy of cultivation in ordinary garden soil, though the more open and sandy it is the better they will like it as a rule.

Planting the Kitchen Garden.—The crops of culinary vegetables are of two kinds, annual and permanent. The first of course require renewing every season; but the latter, when once planted, remain for years. When the portion of the garden which is to be devoted to culinary vegetables is laid out and divided into beds, the permanent crops are usually planted. Where there is abundance of ground, these crops may be arranged regularly, as shown in fig. 77; but where the ground is of an awkward shape, an oblong or square piece may be set aside in the centre for the annual crops, and the permanent crops may be planted in any odd corners or spare ground where nothing else could conveniently be grown. In small gardens these permanent crops are usually confined to asparagus beds, tart rhubarb, and potherbs.

Rhubarb is propagated either by seed or by division of the root. By seed is the best mode when the soil is rich and deep, because the tap-root penetrates at once to a great depth, and the plant is less likely afterwards to suffer from drought; but it will grow quite well by division, which is the most certain mode of continuing particular varieties. The soil being deeply trenched and richly manured, a few seeds may be deposited in drills two feet apart for the Elford, and three feet for the other sorts; and nearly the same distance may be allowed between the plants. A few leaves may be gathered from each plant the third year, but it is seldom advisable to gather any sooner, though one or two leaves may be gathered the second year if the plants are very strong. The progress of the Elford or any of the small growing varieties may be greatly accelerated, and the stalks rendered more delicate by covering the plants with a hand glass early in spring. The kinds usually grown in gardens are *Rheum undulatum* and *R. hybridum*, but numerous

varieties have been raised from these species, the best of which are the Elford Red and the Tobolsk, which are most suitable for forcing; and the Giant Rhubarb, and Myatt's Queen Victoria, which produce immense stalks that are green and very succulent and suitable for the main crop. A light rich and deep soil is most suitable to rhubarb. When it is propagated by division it is done at this season, but the seeds are generally sown in April.

Potherbs.—The potherbs usually grown in small gardens are parsley, fennel, thyme, sage, mint, and marjoram. Several others are mentioned in books, but they are seldom used. Parsley is a biennial, which is generally sown in drills in February or March. Fennel is a perennial, which is propagated by dividing the roots, which may be done at this season. Thyme and sage are shrubs, which may also be propagated by dividing the roots at this season. Mint is a perennial, which is propagated either by dividing the roots or by making cuttings. Of marjoram there are four kinds in cultivation, but only two are generally required in kitchens,—viz., the pot marjoram, which is a suffruticose plant, propagated by cuttings, and the sweet knotted marjoram, which is a biennial, and is generally propagated by seeds which are obtained from Italy. This species, which is very superior to the common marjoram, is called knotted from the flower buds appearing like globular knots round the joints of a stem. The seeds are sown, like those of parsley, in the spring.

The other permanent crops which are grown in large gardens are described elsewhere.

The annual crops are sown in the centre of the garden in oblong compartments which are marked in the plan 1 to 21, the ground being divided in this manner for the convenience of insuring a rotation of crops, it being thought advisable never to grow the annual crops for two years in succession on the same ground. It is necessary to have quite different vegetables on the same piece of ground every season; and this, which is what is usually called the rotation of crops, is insured by dividing the vegetable ground into compartments, and planting them in the following manner. Supposing four compartments of peas are required, then 1, 4, 7, and 10 should be planted with peas the first year; 2, 5, 8, and 11, the second; and 3, 6, 9, and 12 the third, and so on. The second year, the compartments 1 and 4 may be planted with onions; and

7 and 10 with cabbages; and the third year, 1, 4, 7, and 10 may be all potatoes. No exact rules can be laid down, as a great deal must depend upon circumstances, such as the soil, the situation, the kind of vegetables preferred by the family, &c.: but it must be observed that the crops which succeed each other should always be as different as possible; as, for example, peas and beans should never be grown in the same ground in succession, but should each be succeeded by cabbages or onions. The onions in their turn may be succeeded by spinach, and the cabbages by turnips, &c. In some gardens the Vanack cabbage, and perhaps some other varieties, may be almost considered as permanent crops, as they are suffered to remain after the first cabbages are cut, to produce sprouts; but in this case, the stem gradually becomes woody, and the roots elongate like those of perennials or shrubs.

Gathering and Storing the Crops of Culinary Vegetables.—All the main crops should now be taken up; and should any of the tomatoes be unripe, they may be put on a shelf in a greenhouse to colour. Beet, carrots, &c., should be all taken up in this month, and stored for the winter in sand either in sheds or cellars. The main crop of potatoes should be taken up and stored away for the winter. They are generally considered not ready for taking up till the haulm is nearly or quite dead. A dry day should be chosen for the operation, and great care should be taken not to wound the tubers in digging or forking them up. As they are dug up, they should be sorted into three heaps, one heap consisting of the large potatoes which are to be stored up for food; the second heap of the small potatoes, which are to be used for planting; and the third heap of such as are bad; to which some persons add a fourth heap of such as have been wounded in taking up, and which are only fit for immediate use; while others put these to the heap containing those which are bad. The mode of treating the potatoes which are to be stored for winter use is of much more importance than is generally supposed. The potatoes are not unfrequently taken as soon as they are dug up and put in large heaps in a cellar; than which a worse place for them could not be devised, as they heat, commence growing, and many of them will rot in a very short time. If they cannot be stored immediately, they must be partially dried, and, if there is no other place for keeping them till they can be stored but a cellar, they should not be laid in heaps, but spread out thinly; though it is much better, if pos-

sible, to keep them out of doors, laid in small heaps or narrow ridges, and to cover them thickly with straw and soil. The best way, however, of keeping them is by laying them up in long ridges as soon as possible after they are taken out of the ground. They ought not to be exposed to the light a single day after they are dug up; the less they are even dried the better, for drying injures the skin. If the skin and a portion of the substance immediately below it are made to part with their natural juices by drying, the skin will absorb any water that it may come in contact with, and the part that has absorbed the water will soon begin to rot. It is true that if a great quantity of undried potatoes are put together they will sometimes ferment; but all danger of this may be avoided by laying the potatoes in long ridges with divisions of earth interposed occasionally, so as to place the potatoes in compartments, each large enough to hold a sufficient quantity to be taken out at once. When potatoes are put in the ridges it is customary to cover them with dry sand or sandy soil; but since the potatoes have been attacked with disease, many gardeners have used charcoal dust to cover them when they are first laid in the ridges, and it has been found to keep them in a better state than anything else. Some gardeners, instead of either sand or charcoal, use turf, if it can be had, placing the grassy side uppermost and not next the potatoes. Whatever material may be placed next the potatoes, they should afterwards be covered with soil six or eight inches thick, and lastly, with such a thick coating of thatch as will effectually keep out both rain and frost. The great object of storing up potatoes is to exclude the external air, and to keep them from being affected by any changes of temperature, as they are liable to be injured by heat as well as by cold and damp; and Mr. Loudon indeed has remarked that potatoes should be kept as carefully as ice, and as many precautions should be taken in removing potatoes from their winter storehouse as are requisite in taking ice from an ice-house. Some persons put straw next the potatoes when they are stored up for the winter; but this is not desirable, as a very slight degree of moisture will decompose the straw, and by its decomposition carburetted hydrogen is formed, which will make the fleshy part of a white potato change to yellow when boiled. The straw will also communicate a bad flavour to the potatoes, which is very perceptible when they are eaten.

The small potatoes that were set apart for seed should be laid

very thinly, as soon as possible after they have been taken up, on a hard path or pavement, and fully exposed to the sun and air, till they become green; and they should afterwards be laid, still quite thinly, in a dry airy place under cover, till they are wanted for planting for the main crops in the following March.

Digging Over and Trenching Spare Ground.—The ground that the crops are cleared from should be dug over, trenched, or thrown up into rough ridges, so that the air may have a full effect upon it, and the refuse should be picked out and carried to the compost heap. This should only be done in dry weather. When ground is to be trenched and thrown up in ridges to remain during the winter, the trenches should be marked out two feet and a half wide; and, beginning at one end of the first, the ground should be opened two spades deep, and the earth taken out should be carried to the farther side of the ground to where the last trench is to be. When the first trench is opened to the end, another must be marked out the same width as the first, and the upper part of the ground being pared off and thrown into the bottom of the first trench with the grass or weeds downwards, two spadefuls of earth are thrown upon it, tapering in a ridge-like form, so as to be narrower at the top than at the bottom. A third trench is then opened in the same manner, and the earth thrown from it into the second trench, which is also ridged in the same manner; and so on with the other trenches till the whole surface of the ground presents a sort of vandyke or ridge and furrow appearance.

Compost Heaps.—When the crops are gathered there are always some refuse leaves or stems that are not wanted for food, and these, instead of being left untidily in the garden, should be removed from time to time to a heap in the reserve ground; or if there is no such place, to any waste piece of ground where they will be out of sight from the garden, and yet sufficiently near for the gardener to turn them over frequently. It is generally reckoned best, unless the garden is very small, to keep the herbaceous part of this waste separate from the woody part; or, in other words, to make one heap of the weeds, leaves, and runners of strawberries, leaves of cabbages and other vegetables, short grass, the haulm of peas and dead leaves; and another heap of the prunings from gooseberry and currant bushes, fruit trees and raspberry shoots, clippings of box edgings, loppings from shrubs, and the woody stems of cabbages and other greens. The first heap will require merely turning

over occasionally during the summer, and about this season it may have a little garden mould or sand mixed with it. The other heap is generally burnt at this season, a quantity of mould being thrown over the heap after the fire has been kindled, to prevent the combustion being too rapid.

Transplanting Trees and Shrubs.—In the removal of all trees and shrubs, first form the pit where the plant is to be planted, from twelve to fourteen inches wider than the roots will reach. Before raising any kind of shrubs, always bind up the plant with strong straw ropes, tying one end of the rope to one of the strong branches in the centre of the plant, and taking up all the branches, so as to draw them into as small a compass as possible, without injuring the plant. Clear the roots, and, supposing the plant to be six or eight feet high, begin as many feet from the main stem, and cut a trench round the plant at that distance as deep as it may be supposed the roots have gone down; then reduce the ball by degrees with a fork, clearing out the soil with a spade, and taking care not to injure any of the roots or fibres, which should be tied up in trusses with matting, in order to prevent them as much as possible from being injured. Clear the roots to within two or three feet of the main stem, and then undermine the solid piece that is left. When the plant is ready for removal, the strength for lifting it will depend upon its size, and the weight of the ball left, if any. When the plant is brought to the pit and placed in the centre of it, untie the roots and cut off with a sharp knife any that may have been bruised. Shorten the strong ones, that they may make young fibres, upon which the welfare of the plant in a great measure depends. After trimming the roots lay them all carefully out round the pit. If there are one, two, or three layers of roots, as is often the case, keep each layer by itself and lay out the undermost first, taking care to spread out every fibre with the hand. On these spread well broken soil; but in doing this, care must be taken not to club the roots together. After the first layer of roots is well covered, proceed with the next, and so on, until all is finished.

After transplanting, never give the plants water more than once, viz., immediately after the operation of planting is performed, except in the spring planting of evergreens or conifers, when repeated and heavy waterings may be required. Many young trees and shrubs are destroyed (after having been transplanted) by the frequent application of water in dry weather. After the roots are all

well covered, leave the pit three or four inches unfilled, and apply the water according to the state of the soil and size of the plant. To a shrub that covers about four square yards of ground (if the soil is not very moist) give about eight common sized watering-potfuls, and so on for every square yard of ground covered. The only treading to be permitted is merely what may take place in going round them in taking away the rope and spreading out the branches in their original position. The above remarks apply equally well to evergreens as to deciduous trees and shrubs in general. A few kinds that are difficult to remove without balls, when they are large plants, are the following. The holly is one that is impatient of being removed without a ball, and in free light soils it will not lift with one. The best method with it is this: two years before removal open a trench round about the plant about two feet from the main stem (more or less according to its size); two feet will do for a plant six feet high. Go as deep as there are roots, and cut clean off all those outside of the ball, and again fill in the soil. In about two years afterwards the cut roots will make firm young fibres, which will supply the plant with food when it is transplanted. In taking them up always try to get a good ball with them. The laurustinus is not very fond of being removed without a ball. There are but very few of the fir tribe that can be transplanted after they have attained the height of from six to sixteen feet; but the best are the silver, the spruce, and the Weymouth pine. The silver fir bears transplanting tolerably well, provided care is taken not to injure the roots, which run horizontally near the surface. The spruce lifts well, even when sixteen feet high; and the Weymouth pine when from ten to twelve feet high. In raising them always try to get good balls of earth, keeping the roots as entire as possible, and making the pits wherein they are to be planted large, so as to get all their roots spread out as regularly as possible; when covered, water in the same manner as for shrubs. In lifting and transplanting hard-wooded trees, such as oaks, &c., keep their roots as entire as possible, and shorten in any strong ones; they should be well watered. It is very essential to the welfare of plants that have been transplanted to have them well supported, to prevent them from shaking with the wind, &c. For trees from ten to twenty feet high use three poles, set up in the form of a triangle; roll a straw rope round the stem of the tree for the poles to rest on, as it prevents them from hurting the bark; then, after

tying the poles firm to the tree, and fixing them in the ground, the work is finished. For plants of smaller size use small ropes tied in the same manner to the tree, and fixed to stakes driven into the ground, after the manner of tent ropes.

The Rose.—If some of those who sang of the rose so eloquently in the olden time could have seen our now popular and most recent kinds, they would have required a fuller degree of inspiration than the old ones demanded; for the change from the old kinds of roses to those that may now be seen in our best rose gardens and at flower shows, is truly marvellous. Very few people beyond real rose growers, professional or amateur, can comprehend the vast improvement that has taken place in recent years, nor sufficiently know that kinds which were considered the beau-ideal of excellence a dozen years ago are now being discarded by the wisest growers for others richer in colour and form, and more continuously in bloom.

I have an old rose catalogue, date unknown, but evidently of remote times, which it is interesting to compare with one of 1869; there are twenty-two pages in each, and of these some sixteen are devoted in the old one to glowing descriptions of summer roses, and six to autumnal roses. The order of our day is the reverse; sixteen are given to the autumn bloomers, six to the summer ones. The Gallica, Provence, and Hybrid Chinas, &c., were evidently the beloved favourites of the rose growers of those days, though tea-scented Chinas and Noisettes represent the autumn section.

There is also a short list of perpetuals—of which Bernard Du Roi and three colours of the Four Seasons are still grown—but not a single Hybrid Perpetual! Two hundred and fifty is the number of this class in the 1865 catalogue, which nevertheless contains only a selection from an army which, according to a well known Continental list, comprises 600 varieties.

It would be a difficult task to separate all at once the rubbish from the good in this huge list, but we have happily received them by instalments, which have yearly been sorted after trial. Let us begin the selection with the Hybrid Perpetuals, yet re-sifting the varieties, and holding as primary qualities in the selection, good shape and a free blooming, vigorous habit of growth.

Hybrid Perpetuals—Best New and Old Sorts.

Alfred Colomb.	Gloire de Ducher.	Madame Vidot.
Abel Grand.	Gloire de Santenay.	Madame Vigneron.
Alfred de Rougemont.	Gloire de Vitry.	Madame Victor Verdier.
Alpaide de Rotalier.	Jean Goujon.	Mademoiselle B. Des- portes.
Anna Alexeiff.	Jean Lambert.	Mademoiselle Bonnaire.
Anna de Diesbach.	Jean Cherpin.	Mlle. Marguerite Dom- brain.
Auguste Mie.	John Hopper.	Mademoiselle Marie Rady.
Baron Rothschild.	Joséphine de Beauharnais.	Maréchal Souchet.
Baron Adolphe de Roths- child.	Jules Margottin.	Maréchal Vaillant.
Baron Prevost.	La Duchesse de Morny.	Marguerite de St. Amand.
Beauty of Waltham.	La Tendresse.	Marie Beauman.
Belle Normande.	Lælia.	Mathurin Regnier.
Black Prince.	La Fontaine.	Maurice Bernardin.
Caroline de Sansal.	La Brillante.	Monsieur Boncenne.
Charles Lefebvre.	La Reine.	Mr. Chas. Wood.
Camille Bernardin.	Laurent Descourt.	Olivier Delhomme.
Charles Rouillard.	La Ville de St. Denis.	Pius IX.
Chevalier Nigra.	Leopold I.	Pierre Notting.
Claude Million.	Leopold Hausberg.	Prince Camille de Rohan.
Comte de Nanteuil.	Le Rhone.	Prince Leon.
Comtesse de Chabrillant.	Lord Clyde.	Princess Mary of Cam- bridge.
Colonel de Rougemont.	Lord Herbert.	Prudence Besson.
Dr. Andry.	Lord Macaulay.	Queen Victoria.
Duke of Wellington.	Lord Raglan.	Rushton Radcliffe.
Duc de Rohan.	Madame Boll.	Sénateur Vaisse.
Duchesse de Caylus.	Madame Berthe Leveque.	Triomphe de Caen.
Duchesse d'Orleans.	Madame Caillat.	Souvenir de Dr. Jamin.
Duchess of Sutherland.	Madame Boutin.	Vainqueur de Goliath.
Eugène Appert.	Madame Crapelet.	Vicomte Vigier.
Empereur de Maroc.	Madame Clemence Joig- neaux.	Victor Verdier.
Elizabeth Vigneron.	Madame Eugène Appert.	Virginal.
François Louvat.	Madame Fillion.	William Rollisson.
Frederic Bihorel.	Madame Furtado.	Xavier Olibo.
Fisher Holmes.	Madame Domage.	
Géant de Batailles.	Madame Roussett.	
Gen. Jacqueminot.	Madame Rivers.	

There is a small sub-section of this family, called "Hybrid Perpetual Noisettes," which, as it consists entirely of white or delicately-tinted roses, we must not omit. They are always in flower, and so very abundantly are their flowers produced, that for five months they form perfect white masses. We owe them—we ought in gratitude to remark *en passant*—to the persevering hybridizing

skill of M. François Lacharme of Lyons, the raiser of Charles Lefebvre, and many fine flowers. Seedlings, he states, from Noisettes crossed with a semi-double white seedling (of the old blush rose Madame Recamier), which he uses as the parent, or *porte-graine*. He has brighter hopes before him. Having already gained some white flowers tinted slightly with yellow, it is to be hoped he may be able to fix this colour more brightly and decidedly. They are not numerous.

Baron de Maynard.
Louise Darzens.

Madame Alfred de
Rougemont.

Madame Gustave Bon-
nett.
Pavillon de Pregny.

On looking back on the list of Perpetuals, I think it is fortunate other families will not muster as strongly, or my list *in toto* had been anything but a short one. From six to eighteen of each of the other sections will quite complete the list.

Damask Perpetuals come next. The types of this class are not numerous; they are very beautiful, hardy, sweet scented, and they are also continuous bloomers. The best are:

Mogador.

Robert.

Macartney Roses.—Three varieties of these are worth growing for their distinctness. They require a southern wall and thorough drainage, and the second shelter in winter.

Alba simplex.

Marie Léonida.

Berberifolia Hardii.

Microphylla Roses are also evergreen, and require a sheltered wall.

Rubra plena.

Rugosa.

Perpetual Scotch.—Stanwell is a charming variety, blush-pink, of delicious fragrance; but its chief merit is its long continuance in flower, early in May opening its blossoms; and the same tree is often a beautiful mass of white flowers in November.

The *Perpetual Moss Roses* are an increasing class, which needs improving. Some four or six out of the twelve to twenty named in catalogues are worth growing, showing the mossy character, and blooming freely in autumn.

Eugénie de Savoie.
James Veitch.

Madame Edouard Ory.
Perpetual White Moss.

Salet.

The remaining families are the Bourbons and their hybrids; the Chinas, Noisettes, and Tea-scented.

The *Bourbons*, which sprang from seed of a hybrid rose found growing in the island from which they are named, were at one time as numerous as the Hybrid Perpetuals are now; and having many fine dark roses, and freely flowering in the autumn, they were very popular. The violet and dark crimson in this section were, in comparison with other roses of those days, very fine; but having their colours now well represented in the Hybrid Perpetuals, we have no need for them. The few names we give as kinds remarkable for their fresh and peculiar colours, or darks, make a particularly fine autumn show. Some of our best red and pink climbing roses are amongst them.

Acidalie.	Gloire de Rosomenes.	Queen.
Armosa.	Le Florefère.	Souvenir de Malmaison.
Comtesse de Barban-	Madame Angelina.	Souvenir de Louis Gau-
tannes.	Octavie Fontaine.	don.
Dr. Leprestre.	Omer Pasha.	Victor Emmanuel.
Empress Eugénie.	Prince Albert.	Apolline.

The *Hybrid Bourbons* are seedlings between the above and the Hybrid Perpetuals. They have fine cup-shaped flowers, richly scented, with the true Bourbon character of blooming late in summer, and particularly well through the autumn. These roses are very beautiful.

Baron Gonella.	Louise Margottin.	Madame Josephine
Catherine Guillot.	Louise Odier.	Guyot.
Emotion.	Madame de Stella.	Michel Bonnet.
Jules César.	Madame Emain.	Model of Perfection.

The *Noisettes* are American in origin, and reputed to be between the tea-scented and musk roses. They are distinct, of vigorous running growth, blooming mostly in bunches, and well throughout the autumn months; hardy, except where too much of the tea blood is visible. They succeed well near large towns, defying the smoke and blacks even of the London suburbs.

Aimée Vibert.	Cornelie Koch.	Ophirie.
Caroline Marniesse.	Lamarque.	Solfatère.
Celine Forestier.	Maréchal Niel.	Triomphe de Rennes.
Cloth of Gold.	Miss Gray.	Jaune Desprez.

The *Tea-scented Roses* are so well known and so greatly admired as to hardly need comment. They are mostly tender, and need a slight protection. There are in catalogues some 150 varieties, but

twenty to thirty will embrace the leading kinds, and include all the distinct colours.

Abricote.	Gloire de Bordeaux.	Niphetos.
Alba rosea.	Louise de Savoie.	President.
Auguste Vacher.	Madame Falcot.	Rubens.
Canary.	Madame St. Joseph.	Safrano.
Comte de Paris.	Madame de Vatry.	Princess Adelaide, or Victoria.
David Pradel.	Madame Pauline Labonté.	Souvenir de David.
Devoniensis.	Madame Villermoz.	Souvenir d'Elise.
Elise Sauvage.	Moiret.	Souvenir d'un Ami.
Duc de Magenta.	Narcisse.	Vicomtesse de Cazes.
Eugène Desgaches.		
Gloire de Dijon.		

The *Chinas*, or monthly roses, are a small class, blooming almost constantly, as the name suggests. They are grown for this quality, hence we shall name only a few which are very free; others are beautiful, but rather delicate.

The Common China.	Fabvier.	President d'Olbecque.
Cramoisie supérieure.	Mrs. Bosanquet.	

Musk Roses are beautiful as low creepers. As the name denotes, they are finely scented. Double White and Princess de Nassau—both creamy white, the latter rather the larger flower—are good.

Summer Roses, now almost replaced by the autumnals; some few add variety to collections, and are worth growing. They comprise the families of Common and Mossed, Provence, Gallicas, Albas, and Damasks, Hybrid Chinas, Briars, and the climbing section of Boursault Ayrshire, Evergreen, and Banksian roses. Of the Provence, ever favourites for their sweet scent and bold forms, I recommend:

Common or Cabbage	Striped Unique.	Spong.
Provence.	White Provence.	Burgundy.
Reine de Provence.	De Meaux.	

The first four are all large, bold, and full roses. The last three are of dwarf growth, and should be planted by themselves, as liable, when with more vigorous growers, to be trodden down.

The *Moss Roses*, deservedly favourites, are a charming class. In this short list we collect the cream only of the thoroughly mossed varieties. They, with the Provence, are large feeders, requiring thoroughly rich soil with much manure. The best are:

Aristide.
Bataneur de Wassenaer.
 Céline.
 Comtesse Murinais.

Gloire de Moscou.
 Julie de Mersant.
 Lancii.
 Nuits d'Young.

Princess Royal.
 Unique.
 White Bush.

The *Damask* and *Alba*, two beautiful yet small classes, with flowers of the most papery white and delicately-tinted pink and rose colours, to which we have nothing equal in the perpetuals. Those named are vigorous and hardy, large and full flowering.

Damasks.

La Ville de Bruxelles.
 Madame Hardy.
 Madame Soetmans.
 Leda.

Albas.

Félicité Parmentier.
 Madame Legras.
 Queen of Denmark.
 Sophie de Marilly.

Of the *Gallicas*, the good qualities are—they grow anywhere, and are very large and showy. Once the most numerous class, this short list includes all that are worth growing :

Adele Prevost.
 Boule de Nanteuil.

Kean.
 La Volupté.

Éillet Parfait.
 Transon Goubault.

Hybrid Chinas and *Bourbons*, fine summer roses, of good shape, large, and of splendid vigorous habits. For climbing roses, pot culture, and for standards, where very large heads are wanted, they are unequalled. They stand the smoke of even the London squares, and are the favourite roses in Russia, Denmark, and Northern Germany, where the winters are too severe for our Hybrid Perpetuals without protection. A long defence ; but they are favourites, and for recommending the following few any amateur who tries them will not, we feel sure, blame the writer :

Blairii No. 2.
 Blancheffeur.
 Charles Lawson.
 Chenedole.

Comtesse Lacépède.
 Coupe d'Hébé.
 Madame Plantier.

Paul Ricaut.
 Paul Perras.
 Vivid.

The *Briars* comprise the single Austrian yellow and copper coloured : *Harrisonii* and *Persian yellow*, both double flowers of bright golden yellow, blooming very early in summer ; and freely, if in pruning the shoots be thinned out, leaving only the strong ones, which peg or bend down. *Williams's Yellow Scotch*, a pale yellow, succeeds with the same treatment. The *Double Yellow Provence R. Sulphurea*, is the bright amber sometimes seen ; it is capricious in flowering. About Stamford, in Lincolnshire, we have seen it do well, and it generally thrives on chalky soil.

Amongst the summer climbing roses we have our only really hardy enormous growing climbers. The Boursault and Evergreen roses bloom in large bunches and very freely, and grow rapidly and strongly. Trained along chains they form in rosaries perfect festoons of flowers: they cover rapidly any wall, regardless of aspect, and are invaluable for the purpose, and as weeping roses on stems.

The Boursault Roses.

Amadis, or Crimson and Elegans. | Gracilis.

Of *Evergreen Roses* are recommended :

Banksiæflora.	Princesse Marie.	Laure Davoust.
Félicité Perpétue.	Myrianthes Rénoncule.	Madame D'Arblay.
Flora.	Spectabile.	The Garland.
Léopoldine d'Orléans.		

The Ayrshire Roses.—Climbing, running roses, of rough, rapid growth, charming for wildernesses, rocks, banks, and making good pillar or weeping roses. The best are :

Bennett's Seedling. | Countess of Lieven. | Ruga. | Splendens.

Lastly, the *Banksias*, which complete our list. They require a south wall, and a hot, dry, drained situation; bloom well in the southern counties, or in less favoured localities, on the back wall of a high conservatory, when their masses of white and yellow flowers are produced regularly. The white and yellow are the well known kinds. Fortunii, with large foliage and flowers, seems a hardy kind, flowering more freely out of doors.

A budding amateur, in making his selection from the preceding lists, should bear in mind the aspect, situation, and climate under which his garden has the fortune to lie. If with the sunny light of a southern or south-western county, and the rich mellow loams of Sussex or the valleys of Kent under his own and his roses' feet, he may indulge, without much annual danger to his purse, in the Tea-scented or Noisette roses, mixing them in rich profusion and contrast with the hardier Perpetuals and Bourbons. He may have his standards of Elise Sauvage and his golden beds of Madame Falcot and Safranot, and no fear of finding them after some frosty night

“Touched by the icy hand of death.”

In the midland and northern counties the amateur must carefully protect and tend his yellow favourites, but an advantage lieth, me-

thinks, in the richer and more lasting colours of our red roses, most of them moderately frost proof.

It is out of place to enter into the comparative merits of standard or dwarf roses ; both are good in cultivation, and when properly placed, both are beautiful, but undoubtedly it is best to encourage most dwarf standards and plants on their own roots. Dwarfs are undoubtedly the better in exposed situations, but for rows by the side of walks, either singly or in favoured beds, standards are in place, and easily manageable. Such beds—in fact, all beds—should not be of too great width, allowing each rose to be easily approached and attended to.

The best time to plant roses is throughout late October, November, and early December, and again in February and March. A fine day and ground not soddened are the only conditions required. If clay or gravel, let it be deeply dug, or, better, trenched ; taking out a deeper top spit (to use the language of the spade), fork up the underlying subsoil, and, covering it with a layer of rich strong manure, bury this beneath the top spit of the next trench, and so on as far as the bed goes. Follow closely, planting on the newly turned ground, letting the roots just lie above the layer of manure, that the young fibres pushing out may quickly find their nourishment near at hand. Stake, and give permanent labels to newly acquired specimens. I do not think it matters a fig (to use a botanical simile) what is the soil ; with manure, water, and attention, roses may be grown anywhere. I am told peat needs the addition of clay, and in forming a bed on gravelly soil, if the top grassy spit of a neighbouring meadow can be got to take the place of the manure in your trench, it will serve : it is not, however, indispensable.

A word as to stocks. The dog rose, used for standards as well as dwarfs, enjoys and flourishes best in a rich soil. To the Manetti the question of soil seems indifferent, so that it has won for itself the reputation of the rose stock that does anywhere. This is true, roses growing marvellously on it on the poorest soil. One thing in its culture is indispensable to know. Let the junction of the stock and the rose be buried entirely beneath the surface, or the suckers, even then troublesome, will quickly master the variety, and, being carefully cultivated by our amateur, make him wonder his *Sénateur Vaisse* does not flower. It is a thorny, reddish wood, and its character should be learnt by the amateur in an early stage of his career ; it will save him much trouble. If after planting the weather be

frosty, a mulching or covering of the bed with litter is desirable. During fine bright weather remove this and hoe the ground deeply, keeping the surface loose. Late in February and early in March roses should be pruned. If the collection be large, a few may be left until the first week in April; those cut thus late will give some later flowers.

Winter and autumn prunings are bad, the one causing the sap to rise and exciting the plant, and the other, the shoots to die back after cutting. In spring, the sap rising soon after the pruning, soon callouses or heals the cut. In pruning few rules are needed.

The Hybrid Perpetuals, Bourbons, Mosses, and Albas need cutting back the strong shoots to within four or six eyes of the base, either removing or cutting the weak shoots to a single eye.

The Noisettes, strong-growing Bourbons, Gallicas, and Hybrid Chinas, which make nearly all gross shoots, should be left to the length of six or eight eyes; the lower shoots being bent down, they form fine globular heads.

The Climbing Roses need only shortening and nailing the long shoots on to their support, choosing the ripe and removing the weak or unripe shoots.

If the ensuing spring prove dry, water freely and often, keeping the surface loose. Watch well for the enemies of your pets. For the green caterpillar, which bores through and spoils the buds, the finger and thumb are the only remedy; for the green fly, a vigorous healthy growth is a better preventive than any cure; and in late autumn, when mildew appears, dust with sulphur and encourage your roses to a fresh growth to keep off this enemy.—*Mr. George Paul in the "Field."*

Ornamental Plants for Garden Walls.—Every amateur should see that his garden walls, those not devoted to fruit trees, and even the walls of his house and out-offices are covered with handsome climbing plants. Walls afford the best positions for many things that do but little good in the open air without their aid; walls, if well covered and carefully attended to are among the most useful aids to a garden. Well covered in every part with good climbers, the stiffest and most awkwardly placed of wall surfaces becomes a thing of beauty, and may afford interest and flowers at all seasons, from that of the wintry bloom of the clear yellow *Jasminum nudiflorum* to the heats of early autumn, when the fine clematises become masses of bloom. The climate of the British Isles is so much

varied that plants which grow as standards in the south may require a wall in the north; in the south we may have walls covered with sweet verbenas and even with Pittosporum. In the south the fig is grown as a standard, in the north it can hardly exist with a wall. But in all parts we may make good use of every particle of flower garden wall, no matter what its texture, aspect, or height.

The first and most important consideration in the covering of garden walls is the selection of the plants. But even where these are well selected, there is frequently a mistake made in the training, by paying no proper attention to train the tree over the wall in a spreading manner, but on the contrary, allowing it to run "up to a head," so to speak, each plant being top heavy and narrow and naked at the bottom. Instead of taking one good specimen and making it cover a full portion of the wall, people plant them rather thickly, and then keep continually clipping away the luxuriant shoots that ought to widely furnish the wall. The best shoots should be taken out in a fan-like manner so as to cover the wall to the very ground. In training them out, in fact the strongest shoots should be taken to the right and left, perhaps to send up straight shoots themselves. The object should be to keep every part of the wall covered, the centre of the tree as much so as at the top of the wall, and in fact all parts equally. When once the trainer is impressed with the desirability of covering the wall equally in all its parts, he will have no difficulty in doing so. A great point is to make the strong-growing kinds cover a good deal of surface. Confine them to a small space, and you must cut them away fortnightly or allow them to run disgracefully wild.

Now for the selection. A great many things are named in lists of wall plants, &c., which, while doing very well in such positions, rarely flower or exhibit any beauty. To make the selection more useful an asterisk is placed before the names of all such as are A 1 for ordinary purposes, and worthy of general recommendation. The Irish ivy is placed at the head of evergreen climbers. The rich sheets of verdure it produces are not to be equalled by those of any other plant that grows in this country. The varieties of the common ivy are so numerous and beautiful that little space can be afforded for the old forms in the garden proper, but few can resist the charms of the variegated varieties and **Hedera Regneriana*. **Cotoneaster Simmondsii* will prove a rapid-growing, fine thing for high walls and large rockworks. *Bignonia capreolata* and *Tecoma*

radicans, are both good for walls with good aspects in the warmer parts of the country. **Passiflora cærulea* will not do much in the colder parts, but generally will be found to thrive on a warm wall. A house sprinkled over with its showy fruit in autumn looks very striking. **Chimonanthus fragrans*. **Virginian creeper*—things of this kind, that grow freely upon borders and over old trees, &c., should be, generally speaking, reserved for such places, as the wall space will be little enough for the plants that really require its heat and assistance. **Wisteria sinensis* and *alba*. The *Weigelas* are of course fit for low walls, and very pretty; **Magnolia grandiflora* and its varieties, particularly the Exmouth one; **Jasminum officinale*, and **nudiflorum*. The *Escallonias* do very well in milder parts of the country. **Cratægus pyracantha*, *Clematis atrovioacea*, *C. azurea grandiflora*, **C. flammula*, *C. florida*, *C. florida pleno*, *C. Sieboldi* (bicolor), *C. Fortuni*, *C. Hendersoni*, **C. Jackmanni*, **C. lanuginosa*, *C. lanuginosa pallida*, **C. montana*, *C. regina*, *C. rubra-vioacea*, *C. Standishi*, *C. tuberosa*, *C. viticella*, *C. viticella venosa*. The new large-flowered *Clematises*, in the way of *C. Jackmanni*, are noble in size and beautiful in colour. They may be well grown upon a wall, are fond of a light, deep, and sandy soil, and like to have the surface mulched. **Ceanothus azureus thyrsifolius*, *C. azureus grandiflorus*, *C. dentatus*, *C. floribundus*, *C. Lobbianus*, **C. papillosus*, and *C. velutinus*. The *Ceanothuses* do very well in warm districts, and in the west, though they are liable to be cut off occasionally by hard frosts. The Tea Roses. These are the most beautiful of all plants for covering dwarf walls with good aspects, such as frequently occur in terraced and other gardens; and occasionally other kinds, such as the *Banksian*, will be found highly suitable for walls. Strong climbing kinds should not be placed on the select walls, but on rough banks, &c. *Periploca græca*. *Lycium europæum*, good for high and rough walls; fruit bright red. **Lonicera japonica*. **Abutilon vitifolium*—this is a good plant, not at all sufficiently known for this purpose, but fine; may prove a little too tender for some parts, but a capital thing for the milder localities; will require a large stretch of wall. As for fugacious annual plants for walls, it is better to avoid them. All such subjects are better trained on low trellises, as by so doing the trouble of nailing them is avoided; they are supported by the wires and take care of themselves. The great **Rubus biflorus*, with its apparently whitewashed stems, grows freely in the open air in the

south; in many parts the shelter of a wall has proved acceptable. The Camellia may be grown as a wall plant in warm and genial parts of Britain, and even the Tea plant lives with a good aspect and light warm soil. The sweet verberna, so grateful to many, is best grown against a wall, even in those parts where it does not survive the winter. Finally, we come upon one of the most beautiful greenhouse plants in existence—the sweet-scented *Rhycospermum jasminoides*—which sometimes flowers beautifully against a low wall in the warmer parts of the country.

The new large flowered Clematises.—*Clematis lanuginosa*, *azurea grandiflora*, and others have long graced our gardens, and are remarkable for their enormous flowers of various shades of blue; but it is only within the past few years that numerous striking varieties of the family have been noticed at our shows, in various shades of blue and rich dark purple, and which have been for the most part raised by Messrs. Jackman of Woking. They are so attractive in appearance and noble in flower, that doubtless many have been induced to purchase young plants, and therefore a few words on their culture may not be amiss. They are, when well grown and flowered, the noblest of all climbers for walls, trellises, or any other position in which hardy climbers may be desired. They flourish freely planted on the level ground, and allowed to spread over it in their own way. On trellised arches which one occasionally sees in gardens, on the slender wirework fence so often used of late, they are truly beautiful and effective. They, like most things that we have to treat of, enjoy a good rich soil, and if with that it is light and free, so much the better. If the soil is very heavy it had better be made light by the admixture of road sand, leaf mould, and other matters which may be convenient before planting; if light, it must be well deepened and enriched with rotten manure, and stiffish loam, if convenient; but no matter what the soil may be, the secret of cultivating these clematises is to give them a few inches of well rotted manure, on the surface of the earth all round where the roots are, or, in other words, to "mulch" them. If the appearance of the manure is objected to, as it may be by many, it may be covered with an inch of soil, and on that some annual, like the aster, may be grown for the summer months. As regards training, they are best left alone in summer, at least till the shoots get very long indeed; but during the winter months they must be firmly tied or nailed over whatever surface they occupy, as

the weight of flowers is considerable where they are properly grown, and by having the main shoots firmly secured, the rich mass of blooms, many of them as large and larger than tea-saucers, may be allowed to hang down in a graceful and natural manner, which much increases the beauty of the plants and whatever position they adorn.

The storing of bedding plants.—Many grumblings are heard about want of room for storing these—many explanations of what could be done if more room were given, &c.; whereas the fact is that in nine cases out of ten not half the quantity of plants is stored in our houses that their space will permit of. The back walls of lean-to houses are very rarely made the most of. Usually they are furnished with one shelf near the top, whereas they may in many cases be made to accommodate from four to six, and on these may be packed a great number of bedding plants. Some may say that they would suffer on the lower shelves, and that they would not look quite so well as on the top one may be freely granted; but if we select kinds that a few weeks' exposure to the full light in spring will "bring round" again, we shall find such space as useful as any we can possess. The coleus, iresine, lobelia, and many others, will live well in such places; and, if drawn up a little, they may be pinched in spring, and once placed in frames near the light at that season, will soon be fit to plant out. The drip from one shelf to another may appear a serious obstacle; but in the making of the shelves that may be easily prevented. By using the boxes recently recommended, and by fitting them to the size of the shelves, a great deal of watering, and its consequent labour and drizzle, would be avoided at all times, and particularly during the winter months, when to keep houses dry and comfortable is a great object with every one interested in them. To end walls, and every such surface, the same remarks apply.

In wide span-roofed houses, where there are no back walls, some space may be in all cases gained where there is a walk through the centre of the house. It is best done by putting a series of shelves one above another on each hand. They should be supported by iron rods, and in some cases the supports of the roof may be arranged to do this. It is a great improvement on the plan of placing a shelf exactly over the middle of the pathway, so that the drip falls pleasantly down on one's head in midwinter, when the shelves are most occupied. Four narrow shelves may be placed

one above the other on each side of the middle pathway without shading anything but that pathway, so that much space is gained. These facts should be taken advantage of by all with but few glass houses. Persons having an abundance of them may add greatly to their utility without incurring any increased expense for heating, &c., by adopting, with the modifications their various arrangements may require, the several suggestions and plans now described and offered.

As for the scarlet Pelargoniums, now so popular, there should be no difficulty whatever about storing any quantity of the green leaved kinds. The readiest and most inexpensive method is to take them up and leave them for a few days in a shed till time can be got to trim and stow them away. They should then be cut down to within a few inches of the "collar," or part of the stem where it emerges from the ground, and the roots cut in pretty compactly. Then pack them in close lines in cheaply-knocked-together wooden boxes in a not over moist earth, and place them in any convenient place where they will be free from frost. Under the shelves of a greenhouse would do, provided water did not drip there; the windows of any kind of house would do, provided the plants be removed from the influence of severe frost; they may also be stored in a dry cellar or warm shelf or loft, during the very dull months of winter; the soil should be nearly dry, and the plants preserved somewhat after the fashion of roots. But in all these cases it will be necessary to remove the boxes of undeveloped plants from their obscurity in early spring, and give them full light in a greenhouse or forcing-house, or warm pit or frame, so that they may be induced to start into vigorous leaf and growth, and be plump green plants by the end of April. Of course they would grow in windows, but plants treated in that way would hardly be fit to plant out; at least they would be in poor condition for a considerable while after planting out time. Verbenas are not to be kept in this way; they must have a pit or frame, and a pit in a somewhat dry and warm atmosphere is the best place for them. As for calceolarias, the cold frame and hand glasses are generally used for them; but a friend of ours who lives near the sea coast, and whose garden is a pretty free, light, and well drained loam, preserves them easily by simply pricking in the cuttings under his garden wall. They are firmly inserted in the ordinary fine soil of the garden, and remaining there safe all winter, are ready to be

popped into the beds in May. That plan might fail during a very hard winter, and would not suit in a cold soil or neighbourhood. On the whole, the best and cheapest way for those who must indulge in bedding, is to have a snug little dry pit made for the reception of their plants, with a hot-water pipe running round it ; that is, if there is not room enough for the bedding stuff on the shelves of the greenhouse. What a blessing it is that the rose and many of our finest hardy flowers do not require six months "coddling" in winter. Some day people may have the satisfaction of avoiding all or much of this trouble by paying due attention to fine hardy things ; and the sooner the better. The rough wooden boxes we have mentioned may be knocked together on wet days by the men. The bottoms should be made of strips of board a few inches wide, a space of an inch or so being left between each to allow for drainage. That will be found a much better plan than making the bottom solid and boring holes in it. Such boxes are most useful for preserving all kinds of bedding plants. The plants do better in them than in pots, because freer from rapid changes of drought or moisture, and require far less attention than when in pots. These boxes are of course much cheaper than pots or pans.

Garden Enemies.

Insects.—On examining apple trees at this season, they will frequently be found to have on the stems and branches little tufts of a white woolly or cottony substance, which is, in fact, the covering of a most destructive insect. This insect, which is vulgarly called the American bug or American blight, appears to have been first known in this country about the year 1787, when it was found by Sir Joseph Banks in a nursery at Kennington, though Sir Joseph afterwards ascertained that it had been seen some years previously in a nursery in Sloane-street, kept by a person of the name of Swinton, who detected it on some apple trees which he had imported from France. Those seen in 1787 were also found upon apple trees which had been imported from France ; and in 1790 the insects made their appearance in Lee's Hammersmith nursery, where they were also found upon some French apple trees. When the insects were first discovered they were thought to be a kind of coccus, from the insect being enveloped in a white woolly

substance, and giving out a red liquid when crushed like the coccus of the vine, or that of the opuntia, which is commonly called the cochineal; but on closely examining the insect, it was supposed to be a kind of aphid, as it was found that the male insect only was winged, and that the female injured the trees with its proboscis, in the same way as the aphid of the rose injures the young shoots of that plant by sucking out the sap. It is now placed in another genus, called Eriosoma, as it differs from the aphid in its short filiform antennæ, its woolly body, and its abdomen being destitute of horns or tubercles towards the apex. It is a remarkable circumstance respecting this insect, that though it was always found, when it first appeared in this country, on apple trees which had been imported from France, yet when Sir Joseph Banks wrote to the French gardeners respecting it, it was quite unknown to them. Both the male and female insects are covered with a white cottony substance, and in very hot weather the male may now and then be seen upon the wing, where it has just the look of a bit of cotton, or a downy seed floating in the air, and is driven by every breath of wind quite as readily. Wherever these insects establish themselves, the branch they have attacked soon appears ulcerated or cankered, the tree becomes disfigured, and in a few years it dies. Various remedies have been proposed to stop the ravages of this destructive insect, but the most efficacious appears to be to brush the tree over with spirits of tar as soon as the leaves have fallen, and a little later in the season to clean the tree as thoroughly as possible with a brush and water, and then to fill up all the cankered parts with a mixture of clay and water. This was the plan pursued by the late Mr. Waterton, and he found it perfectly efficacious. A similar kind of insect has been found on the roots of lettuces. These plants are sometimes observed dead or dying without any apparent cause, but on pulling them up the roots will be found thickly matted together with a glutinous cottony substance, among which are hundreds of the larvæ of a species of Eriosoma. These little creatures are green, and very active, and the perfect insect closely resembles the blight of the apple.

NOVEMBER.

General Observations and Directions.

The Weather, &c.—The weather in November is generally very cold and damp, and towards the end of the month it usually becomes frosty.

Open Garden.—When the frost has destroyed the foliage of dahlias they should be taken up and removed to some dry shed, where they may be safe till starting and propagating time arrives. The sowing of the earliest crop of peas is frequently performed about the middle of this month; but so many accidents are they liable to in winter that generally it is better deferred till spring. The spring sowing comes in very little, if at all later. However, a drill or two may be tried on a warm border. Employ the earliest kinds, and cover pretty deep, placing a layer of sifted coal ashes over the soil, which will prevent the attacks of mice. As a rule, celery should now be well earthed up to save it from frost; but in case of those rows not yet attained to a full size, it will be better to allow the tops full exposure to the air for some time yet. Store carrots and beetroot; the last is best up before much frost comes. All such work as the clearance of asparagus beds, the trimming, manuring, and protection of artichokes, &c., should be performed at once if not already done. Pruning should now be in full operation, as most kinds of hardy fruit trees are ready for the operation. Draining and all trenching and digging should be proceeded with on all favourable occasions; also the root pruning of trees, planting of all sorts; and these operations, with the cleaning and clearing which is inevitable at this season, will keep all busy enough. Now is the best time for planting all sorts of fruit trees, and therefore they should be selected, and ground prepared at once if that is not done already. In planting, avoid all highly manured and deep borders, in which the roots would feed too grossly and make the trees fertile in coarse and soft wood,

but not in fruit. Also avoid wet by thorough drainage, and if the situation be stagnant and moist, place the roots of the plants pretty high. Leaves of all kinds will now be falling everywhere, and every careful gardener will be stowing them away with a view to a good supply of leaf mould. It should be remembered that quantities of oak and other leaves now gathered and placed in a heap in some byplace to ferment, and mixed if convenient with a little stable litter, will by and by prove most useful for forcing and for many other garden purposes.

Indoor Department.—In the conservatory, now that the cold and dull season has arrived, a gay appearance will be greatly appreciated, and will call for extra exertion on the gardener's part to keep up such a supply of attractions as the means at his command will accomplish. Chrysanthemums will now predominate; these will be succeeded by primulas, violets, tea-scented roses, tree carnations, &c. This is the best time to determine what kinds of chrysanthemums are most worthy of propagation, and to see other collections with a view to adding novelties to those already grown. Keep plants in pits and in cool houses well aired on all favourable occasions. The frames containing bedding plants should also be kept well aired on fine days, and all decaying matter removed. Respecting these, it should also be borne in mind that plants kept comparatively dry, and in dry frames, pits, &c., in winter, can endure more frost than if moist; and still more important is it to remember that when plants are frozen the sure way to kill them is to allow the sun to shine on them; the sure way to save them is to let them thaw in the dark or shade. In the forcing house successions should be made of the different plants mentioned last month. These include such plants as *Dielytra spectabilis*, *Deutzia*, *Kalmia*, *Azalea*, roses, hyacinths, &c.; these, with the things that come in without extra heat in winter, like *Cyclamens*, heaths, *Epacris*, &c., will make a beautiful show not many weeks hence. Wherever the early forcing of grapes is carried on, the border should be covered with litter and tarpauling, or rough shutters of some kind, to throw off the heavy winter rains, and to prevent the soil from becoming cold and saturated. In the case of properly made vine borders of houses that it is not intended to start till March, covering the borders is often practised, and if convenient desirable, though not absolutely necessary if the drainage be perfect. All indoor work should be done as far as possible on wet

days. So often does the weather prevent operations from being carried on in the open garden, that one of the chief considerations with those who manage gardens well is to provide useful work which the men can comfortably do on wet days. Much is often done in fine weather that might well be left till rainy days, and frequently garden men have nothing to do in bad weather from want of management in this respect.

Those who desire their pot strawberries to yield good crops from spring till the time the out-of-door crops ripen, should just now have all their plants exposed to the full sun and air, standing on slates, rough wooden trelliswork, or some material which will keep the pots from contact with the earth, and the worms from making their way in. Give but very little water. The pots should now be full of roots, and the crowns ripening in the full sun as we have described. In a few weeks they must be removed to other quarters.

Things not to be done in November.

Never allow the covering of frames or other plant structures to remain on during the day, unless the weather be very severe. It is rarely cold enough to demand a covering for the frames throughout the day till near or after Christmas.

Never water plants after mid-day during winter.

Never cut box edgings late in the season.

Never repot plants when they are very dry without watering them previously to doing so. The most effectual way of moistening dry balls is to steep them in water.

Never lay by dahlias when wet.

Never omit digging flower beds as soon as the plants which have been growing in them are killed by frost.

Never water plants in cold pits over head at this season.

Do not permit the plants in cold pits and frames to get drawn from want of air or exposure, or they will be much more likely to perish in winter.

Principal Operations in November.

The Chrysanthemum.—The principal object in view in making a few notes on this autumnal flower is to improve if possible the

aspect of the private conservatory in the early winter months, and indicate how the chrysanthemum may be used to the best advantage as a decorative plant for festive occasions. Chrysanthemums alone are as a rule insufficient to satisfy a tasteful eye seeking the gratification that should accompany a display of flowers. There are among them no pure colours save yellow, but in tones of yellow and pure white, and soft shades of flush and rose, the flowers cannot be surpassed. The monotony which oppresses us in viewing a large quantity is due to the prevalence of impure secondary tints and the repetition of the same ungraceful forms. Judging the case by the exhibition test, it will be found that an autumn show becomes a glorious affair if well-grown chrysanthemums are intermingled with fine foliage plants, such as ferns, palms, and cycads and with miscellaneous flowering and berry-bearing plants, such as poinsettias, justicias, and solanums. In embellishing a room for a feast at this season of the year it is a proof of poverty or bad taste to employ chrysanthemums only; and in every conservatory we should find relieving agents of some kind or other to enhance the splendour of our leading autumn flower.

Granting all these points, it is quite certain that the chrysanthemum is worthy of the best care that can be bestowed upon it. Having no desire to argue out the case to either a sweet or bitter end with those who do not "seem to see" the beauty of the flower, it is sufficient that it comes at a season when there is little else in the flowery way to be got, that it has thousands of admirers, and that it particularly suits the middle class cultivator, because to do perfect justice to it requires no great outlay, though it does demand considerable skill. It is not attempted to describe the painstaking and elaborate process by which specimen plants are produced, measuring seven to nine feet across, perfect in convexity like a watch-glass, with all the leaves spread like a carpet, and the flowers dotted above them with the regularity and sharpness of a pattern from the loom. There are books by Salter, Hibberd, and others, that tell of all this in fullest detail, and the would-be exhibitor is left to consult them. But for the conservatory of a lady or gentleman leading a quiet country life something less elaborate is wanted: and we would encourage all the homely florists amongst our readers to give some amount of attention to the chrysanthemum. From the present time until the end of March the young plants may be obtained and started into growth; and if the hugest possible speci-

mens are required, not a day must be lost. But for the production of useful plants with good average flowers, February is early enough to begin. From this time until then, the old plants require to be kept in a frame safe from frost, but with free exposure to the atmosphere at all times, except during drenching rains, snow, and frost. In February pull these old plants to pieces, and pot a few of the shortest, stoutest, and greenest, that have a few roots to begin life with. If you have no old plants to commence with, obtain newly-struck cuttings from a nursery; and as they will cost next to nothing, there is no danger to your fortune in so doing.

To grow chrysanthemums of any kind is a most easy matter, if for the present is put out of mind the production of specimens trained to some particular shape; all the complications and elaborations arise out of the training and the finishing for exhibition. To grow the plant naturally is about as simple a matter as any distinct task to be found in the range of gardening. Never give the plant a larger pot than it can soon fill with roots. Never allow it to become pot bound until the latter part of September, when the pot should be quite full of roots. This part of the subject may be summed up thus: Shift the plant into a larger and larger pot as it fills each pot with roots until about the end of July, and then shift no more. As to soil, any good nourishing loamy soil will answer, and from the end of July until the buds begin to show colour it will benefit them immensely to water the plants with weak liquid manure. It scarcely matters what the liquid manure is made from—whether sheep-droppings steeped, or dissolved guano, &c.; but it must be so weak as to be rather in the character of pure water spoiled than a mixture having evident manurial properties. Two of the most successful cultivators ever known owed their success to the constant use of diluted ditch water. As for the exhibitors, they use strong stuff; but then they know how to use it, and these hints are offered to people who might find strong stimulants a sure means of killing their chrysanthemums. Full exposure to sunshine and rain is of the utmost importance from the middle of May until the middle of October, when the plants should be housed and have abundance of light and air in the conservatory. As to minor matters, all that need be said is that the plants must have the support of stakes in due time; observation and judgment will determine the rest.

So having treated all the classes alike, the plain fact is that they

may all be treated in the same way. But it will be an advance on this rude practice to attempt some kind of training. Let us therefore speak first of the large-flowering kinds. Procure your young plants in thumb pots in February or March, and at once nip out the point of each. Keep them near the glass in an airy greenhouse, and a week after the points have been pinched out, shift them into 60-sized ($4\frac{1}{2}$ in.) pots. In four or five weeks after the first pinching, pinch all the points again, and ten days afterwards shift the plants into 48-sized (5 in.) pots. In about another fortnight pinch all the points again, and a fortnight after that shift them into 9-in. or 11-in. pots, fill in the soil firmly, and plunge the pots out of doors to the rim. Now begin to train them by pegging out the branches all round equally, so as to spread the growth over a considerable space. There must, however, be no more pinching and no more shifting, but they must never suffer for want of water, and must have liquid manure after the pots have become full of roots. In the last week of September insert a few sticks in the pots, and tie the principal shoots loosely to them, to allow of lifting the pots from the border without damage. When they are placed on a bench in a convenient place, stake and tie them carefully, so that the points of the shoots are evenly distributed, allowing a sufficient length of shoot from the topmost tie for the point of the shoot to turn its head upwards, as it soon will do, as the leaves also will right themselves, and make a close mass of vegetation. As soon as tied, place them very near the light in a cool greenhouse, and take care they never want water, and in due time they will make a fine display.

Pompones may be dealt with in precisely the same way, but these may also be grown as short untrained bushes, and will in that form be very useful. If specimens are wanted, the process of producing them will be much the same as above described; but to get up a quantity of compact bushes, plant out in the open ground in April a lot of short well-rooted suckers, give them water when needful during the summer, and pinch out all the points three times—say once in May, once in June, once in July. In the early part of October take them up carefully and pot them. Place them in a damp shady nook, and twice a day give them a light shower from an engine, but no water at the root; they will scarcely flag for an hour if well handled, and in ten days from the potting they may be housed, and have water over head and at the root as they require it until they bloom. Thousands are grown in just this way

for Covent Garden market, and they are the best of plants for autumnal display where the plunging system is practised.

A few selections may be useful, and they are made short and various.

The best large-flowering Chrysanthemums for Colour.—Chevalier Domage and Jardin des Plantes (yellow); Prince Albert, Progne, Julia Lagravere, Dr. Sharp, Alma (crimson); Christine, Alfred Salter, Eugénie, Hermine Delval, (rose); Virgin Queen, Vesta, Defiance (white); Pelagia, Etna (fiery red).

A few fine incurved Chrysanthemums.—Aimée Feriere, Antonelli, Beverley, Duchess of Buckingham, White Globe, Golden Eagle, Hereward, Jardin des Plantes, John Salter, Lady Harding, Mrs. Brunlees, Prince Alfred, Princess of Wales (Davis's), Sir Stafford Carey, Trilby, White Queen of England.

The best Japanese varieties for the Conservatory.—Aurantium, yellow; Comet, orange and chestnut; the Daimio, rosy lilac; Wizard, red maroon; Tarantula, yellow; the Tycoon, red and orange; Yellow Dragon.

A few fine Pompones for Specimens.—Aigle d'Or, Général Canrobert, Duruflet, Florence, Madame Eugénie Domage, Lizzie Holmes, Miss Talfourd, Miss Dix, Rose Trevenna, White Trevenna.

Cyclamen persicum.—At this season this lovely flower begins its long season of bloom; neat and dwarf in habit, free to produce its vividly and often delicately coloured flowers—equally charming in all the tints its varieties present—hardy enough for the coolest greenhouse, and quite at home when brought into the drawing-room to bloom in spring. All who enjoy indoor spring and winter flowers should secure a good stock of it from seed. When the seedlings are large enough to handle and prick into small pots, they should be carefully potted and shaded for a few days after the operation, using light rich soil with a good deal of leaf mould in its composition, and also some silver sand. The seedlings should be grown on as fast as possible in cool pits, or in a low, light, moist greenhouse—indeed, in any such structure, provided they be near the glass; the low pit, however, is best for the summer growth, and a shelf near the glass in a greenhouse for the winter quarters. The plants should be kept moist and growing along through the winter, and never *dried off*, which is a common way of treating cyclamens, though productive of no good to them whatever. The growth should not be checked at any season. So treated those seedlings should be

free-flowering healthy specimens in twelve or eighteen months from the time of sowing. They should be placed in the small pots from the seed pan when very young, so that the necessity for disturbing the roots may be as little as possible. In after pottings the ball should not be disturbed; but we have seen them flower freely in the first small pots they were placed in from the seed pan. As the culture of this plant is so very important, and likely to furnish so much pleasure to many amateurs, the following article by a very successful cultivator may prove useful. It is taken from the "Gardener's Magazine."

"The first thing to be thought about is the soil. In all stages of growth a compost prepared as follows cannot well be improved. At all events there is no difficulty in obtaining good specimens potted therein if other matters are managed all right. There is one sure thing, that cyclamens will not grow freely in close stuff; they require a light, rich, open soil, full of fibre, in which they can root freely. The exact quantity of soil to be mixed up depends of course upon the number of plants to be potted; but we will suppose two barrowfuls to be required. The first barrowful should consist of good mellow silky loam, full of fibre, and chopped up into moderately small pieces, and the other barrowful should be composed of equal quantities of fibry peat that will not soon turn sour, leaf mould, and well rotted cowdung. Added to the whole bulk, should be sufficient silver sand to make it feel gritty—say about a sixth part. The only difference in its preparation for the seed pots, and for potting older bulbs, is simply that it is chopped up rather finer to admit of the young plants being transplanted without seriously injuring the roots. It makes no material difference whether the seed is sown in pots, pans, or boxes. I use five-inch pots; whichever are used it is essential to have them well drained, for the young plants have to remain in them for some time, and if the soil gets soddened and sour they will make but sorry progress. Two inches of rather small crocks will not be too much, and it will be necessary to cover them with a few pieces of flaky leaf mould, or something of that description, to prevent the soil washing down amongst them. The pots require filling to within half an inch of the rim, the seeds sown, and just covered with a sprinkling of fine soil, and that part of the business is finished. From twelve to eighteen seeds placed at regular distances apart, are quite sufficient for each pot, and then there is no

trouble of having to transplant the young seedlings until they are large enough to be potted off into small sixties.

"From the time the seed is sown till the points are nicely up, the pots should be placed in a propagating case, the temperature of which should be about 70°. The close moist atmosphere of the case suits them admirably. After the development of a couple of leaves, the pots should be removed from the case to a shelf close to the glass of a house, the temperature of which should average 60°, remain there until the bulbs are the size of large peas, and then be potted off into small sixties and subjected to the same temperature as before. The watering must be done somewhat carefully at all stages, more particularly during the time they are in the seed pots, so that the soil may not get sour and check the healthy development of the roots.

"Seed sown and treated as advised will produce plants stout enough to be potted off by the beginning of the year, and from that time until the end of May they will require a moist growing temperature, increasing it from 60° to 70° as the season advances. At the latter period the plants can go out into a cold frame for the summer; but they must not be dried off, but be grown steadily on throughout the season. Here it should be distinctly understood that the plants should not be dried off at any time during the first year of their existence. It is a mistake to suppose that these plants require so much drying off as is commonly practised. Early in August shift them into five-inch pots, and press the soil firm. The above mentioned size is quite large enough for the largest sized corm, as over-potting is an abomination to them. The cold frame will still be the best place up to the middle or end of September, when they can go to the greenhouse and receive such treatment as may be considered necessary according to the time they are wanted to be at their best. Like other plants, these will not need much water until they get established in the fresh soil and begin to make new growth, when it can be increased in a reasonable manner.

"After they reach the greenhouse in September they must not be coddled up, neither must they be exposed to so much air as New Holland plants. A temperature of about 45° by fire heat, and a little higher, aided by the sun, with moderate ventilation, will suit the general stock. Any that are wanted for blooming very early must have rather more warmth, and others for late work.

to be kept rather cooler. As a rough guide, it might be said that they will do well under the same conditions as the Chinese *Primula* with respect to warmth and ventilation. Through the winter keep as close to the glass as circumstances will allow, and expose to the full light both for the general health of the plants and the prevention of lanky foliage and flower stalks. However compact a habit a plant may have, it will suffer derangement if removed too far from the glass, or crowded among other things which obscure the light. The atmosphere must be kept dry as they come into bloom, to preserve the purity of the light-coloured flowers. The 'beautiful spotted appearance' which is admired by some people, certainly does not improve them, and is caused solely by a damp atmosphere. I am no greater an admirer of spotted cyclamens than I am of pinks or pansies, the colours of which have run into an indefinable muddle. I like purity and decisiveness in the colouring of all florist's flowers, no matter what they may be.

"I have dealt with the seed sowing, therefore it is not necessary to go through that again. And we now arrive at the stage where the plants are dried off. The drying off must be done gradually to allow the seed plenty of time to ripen, and also to fully mature the corm before the growth is completely stopped. The corms have generally from three to four months' rest; but they do not require that time, as a month is quite sufficient, or, at the utmost, six weeks. Well, at the expiration of that period, from the time the corms are thoroughly at rest, they must be repotted. The whole of the old soil must be shaken entirely away, without injuring the roots. The same size pots will again do for most of the corms; but the largest may go into the next largest size. The roots must be preserved intact, and nicely spread out as the potting goes on, for little success can be expected if they are thrust into the pot in a bunch and the soil stuffed round them. It is impossible for them to take kindly to the fresh soil, and it must be ever remembered that careful potting is half the battle. After they are potted, place in a frame in a shady position with the lights drawn off, excepting in wet weather, and keep the soil just moist until they begin to start into fresh growth, and from that time increase the water supply. Use soft water, and keep the corm on the surface of the soil."

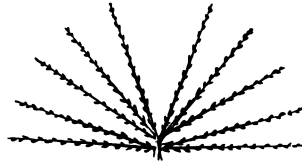
Pruning and Training Wall-fruit Trees.—This is the season for the winter pruning and training of most kinds of fruit trees.

Pruning consists in depriving a tree of a portion of its branches, in order to throw more vigour into the rest ; and in pruning fruit trees, the object is also to remove those branches which are more likely to produce leaves than fruit. The great object therefore of the pruner, is first to ascertain what kind of branches are most likely to bear fruit, and next how to force the tree to produce more of such branches than of any others. The kind of branches that bear fruit vary in different trees ; peaches and nectarines are produced on the shoots of the preceding year ; grapes on those of the current year ; and pears and several other fruits on old wood of two or three years' growth. In wall-fruit trees, pruning is generally combined with training, the advantages of which have been already stated ; and there are several modes of training which are considered adapted to different trees. The principal of these are the fan, the horizontal, and the upright. Peaches and nectarines,

FIG. 84.

*Common Fan-training, first stage.*

FIG. 85.

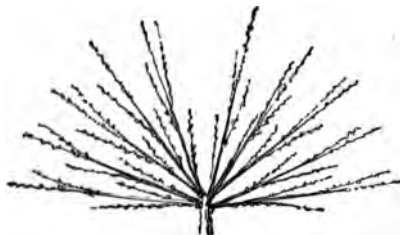
*Common Fan-training, second stage.*

and Morello cherries, which bear on the young wood, are generally trained in the fan manner, as are occasionally plums and sweet cherries ; but they, and pears and apples, which all bear on spurs, generally grow and bear best when trained horizontally.

Fan-training.—Seymour's mode of fan-training has been already given ; but the following method is much more common. The young plant is headed down to four buds, placed so as to produce two shoots on each side of the tree, as shown in fig. 84. The following season the two uppermost shoots are to be headed down to three buds, placed so as to throw out one centre shoot, and one shoot on each side of it ; the two lowermost shoots are then to be headed down to two buds, so as to throw out two shoots, as shown in fig. 85. There are now five shoots on each side, well placed to form the future tree. Each of these shoots must be placed in

the exact position in which it is to remain, and none of them are to be shortened; but the tree should by no means be suffered to bear any fruit this year, and each shoot should be suffered to produce one shoot at the extremity of the branch, and two other shoots on the uppermost side, one near the bottom, and one about midway up the branch; there must also be one shoot on the undermost side, placed about midway between the other two. All the other shoots must be pinched off in their infant state. The tree will then assume, at the end of the third year, the appearance shown in fig. 86. From this time it may be allowed to bear what crop of fruit the gardener thinks it able to carry; in determining which he ought never to overrate the vigour of the tree. In succeeding seasons, as the object is to cover the wall and to preserve

FIG. 86.

*Common Fan-training, third stage.*

an equal flow of sap through every part of the tree, shoots should be occasionally shortened to induce them to throw out other shoots in the situation required: and all badly placed shoots, and those which appear likely to produce leaves instead of fruit, should be removed.

The horizontal system of training consists in allowing the tree to have an upright stem, with branches proceeding from it at right angles, which are from nine to eighteen inches apart, according to the vigour of the tree. A young plant with three shoots having been procured, the upright shoot is trained against the wall, and the two side shoots are laid in horizontally, or nearly so, as shown in fig. 87. All the buds are rubbed off the upright shoot but three, viz., one next the top for a vertical leader, and one on each

side, as near the top as possible, for horizontal branches. In the course of the first summer after planting, the shoots are allowed to grow without being stopped; but in the autumn the side branches are nailed in, the superfluous shoots are removed, and the centre shoot is headed down, as shown in fig. 88. In the second summer,

FIG. 87.

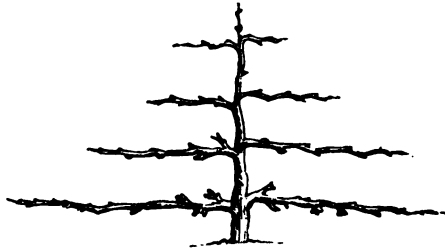
*Horizontal Training, first stage.*

FIG. 88.

*Horizontal Training, second stage.*

if the plant is in a state of vigorous growth, the main shoot may be stopped when it has attained the length of ten or twelve inches, and this will cause it to throw out two horizontal branches from the young wood in addition to those thrown out from the wood of the preceding year, as shown in fig. 89, the laterals from the

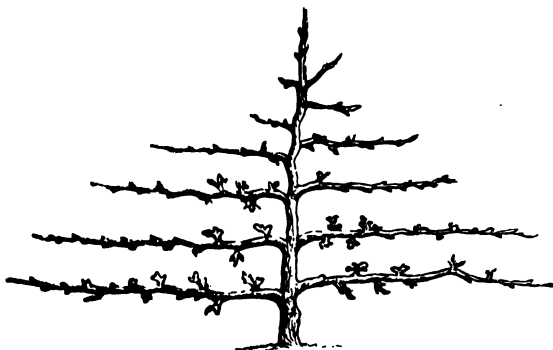
FIG. 89.

*Horizontal Training, third stage.*

lower side shoots being stopped. The following autumn, if this system is pursued, the plant will have obtained two or four more horizontal branches; and if the laterals from the side branches were stopped as they appeared, they will now have formed short stunted branches, which are called spurs, and which, on the lower

side branches, will become covered with blossom-buds. The following year the same system must be pursued, and the tree will present the appearance shown in fig. 90. It must be observed that it is only on the short shoots proceeding from the spurs that blossom-buds are formed, and that when one of these shoots has borne fruit, it should be cut down to the base at the following winter pruning, to force the spur to send out fresh shoots for blossom-buds. Apples, pears, cherries (with the exception of the Morello), and plums, all bear upon spurs; but the spurs of the apple are produced upon the wood of the previous season, while those of the pear are produced upon wood which is two years old

FIG. 90.

*Horizontal Training, fourth year.*

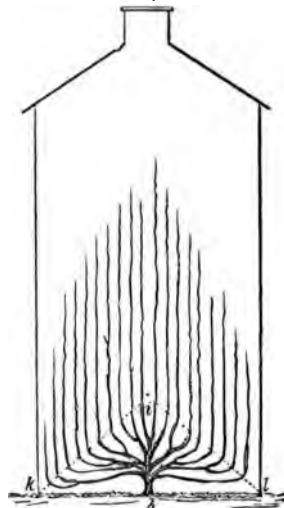
or more; and plums are produced on spurs proceeding from wood of two or three years' growth, and the same shoots frequently bear several times. Cherries are produced on spurs both of the old and new wood; and as the branches are continually throwing out fresh spurs, the bearing branches of a cherry tree should never be shortened. Morello cherries are pruned and trained like the peach, as they bear on the young wood. Apricots are generally trained horizontally, but as they bear at the ends of the branches they require very little pruning.

Other Modes of Training.—Some gardeners unite the fan and horizontal systems by training young trees in the fan manner the

first two or three years, and then bending their branches in the horizontal manner, as this is said to strengthen the lower branches. Another mode is to train the branches horizontally at first, and then to bring them upwards, as shown in fig. 91. But in this mode it is much better to throw the strength into the outer branches first, instead of the central branches, as shown in the figure. This mode of training is very useful for the gable end of a house or stable. Apricots may be trained in both the fan and horizontal modes, as they bear their fruit partly on the young shoots of the past year, and partly on spurs arising from the two or three years old branches. Vines on the open walls are trained in the spur manner, that is, with one principal stem, the side stems from which are pruned so as to make them form spurs.

In pruning *espaliers*, the same rules must be followed as for wall-fruit trees; but for *standard trees* the principal object is to let light and air into the centre of the tree, which is done by thinning the branches. The walnut tree should have the points of the shoots cut off, to force the tree to produce spurs. "The principal art in the culture of the filbert, as a fruit tree," says Mr. Loudon, in his *Arboretum Britannicum*, "consists in training and pruning it properly, as the blossom is produced upon the sides and extremities of the upper young branches, and from small young shoots which proceed from the bases of side branches cut off the preceding year. The tree requires to be kept remarkably open, in order that the main branches may produce young wood throughout the whole of their length. In the filbert orchards about Maidstone, the trees are trained with short stems like gooseberry bushes, and are formed into the shape of a punch-bowl, exceedingly thin of wood." Medlars and quinces are pruned and trained like the apple. The objects to be attended to in pruning are, when the

FIG. 91.



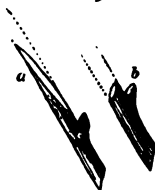
Horizontal and upright
Training combined.

trees produce their fruit on the young wood, as in the peach and nectarine, always to shorten the branches of the preceding year, so as to force them to throw out fresh shoots; and where the fruit is produced on spurs, as in the pear, to prevent the spurs from becoming too large, by removing every year the shoots which have borne fruit.

Currant bushes may be pruned about the end of this month; the objects being to keep the centre of the tree open, so as to allow the sun and air to have free access to every part of the wood; and to encourage the growth of fruitful spurs, by cutting out those which have already borne, and shortening the laterals produced in the summer to a bud or two. Cuttings of gooseberries and currants may be made at this time. They should be taken from healthy trees, and each should be from ten to twelve inches long, according to the habit of the plant from which they are taken, all the buds except the three or four top ones being destroyed.

In all cases of pruning great care should be taken to cut off the branch or stem in an oblique direction, a short distance above the bud, as shown at *b* in fig. 92; and the section should never

FIG. 92.



Mode of cutting
a Branch.

be made more oblique than is necessary to insure its soundness and smoothness. When due attention is not paid to this rule, and the cut is made very obliquely to the line of the shoot, a wedge-like stump is left protruding beyond the bud or branch, as shown at *a* in fig. 92, which never can be healed over, and which consequently soon decays, and disfigures and injures the tree, by retaining water and bringing on the rot; but when the cut is made not more than the thickness of the branch above the bud or shoot, and nearly directly across, as at *b*, the wound is healed over completely and in the shortest possible time. It must be observed, however, that the distance of the cut above the bud must depend in a great measure on the porosity of the wood of the shoot, and the proportion of its diameter which is occupied by the pith; for if the raspberry and the vine were cut close above the bud, the shoot would dry up below the bud, and prevent it from developing itself. Hence, in all such cases, and even sometimes in common fruit trees, it is customary to make the first cut an inch or more above the bud; and when the shoot has grown and produced two

or three perfect leaves, to cut off the remaining stump. This would be the best mode in every case, but as it occasions double labour, the risk of its not being attended to induces most persons to cut near to the bud at once.

Protecting Trees, Shrubs, &c.—The great point to be attended to in acclimatizing woody plants is, first to ripen the wood well the preceding summer; and secondly, to keep the plants in a state of entire repose during the latter part of the autumn, the winter, and the early spring. To ripen the wood well, the growth of the shrub should be encouraged during the summer months, but checked in autumn. This is done by planting the shrub in an open warm situation, in a rather poor and perfectly well-drained soil, and then watering it well in the growing months, lessening the quantity towards the end of July, and leaving off the watering entirely in August. Should the season be warm and dry, withholding the quantity of water the shrubs have been accustomed to, will be quite sufficient to check their growth; but if the season should be wet artificial means must be resorted to—such as supporting a cover or light wooden roof over the plant by four sticks, so as to keep it and its roots from the rain; or laying tiles or some other covering round the stem, so as to keep the rain entirely from the roots; or cutting trenches just beyond the extremity of the roots, to drain as much moisture from them as possible. When the wood has been well ripened, half hardy shrubs are easily protected by placing round the base of the stem a thatching of straw made so as to take off at pleasure; or by covering the collar and roots with straw, decayed leaves, moss, or any light dry loose material. Camellias and magnolias are very easily protected in this manner; and indeed there were some camellias in Chandler's nursery, near Vauxhall, which stood out eight or ten years without any other protection than covering the collar and roots with a thick mulching of straw every winter, and taking care to ripen the wood well every summer and autumn. It may here be observed, that all half-hardy evergreens, with thick fleshy leaves like the camellia and the evergreen magnolia, are injured by being matted up, and should never be protected otherwise than by mulching, and a coping, when planted against a wall; whereas the acacias and other Australian shrubs, together with all the tender species of the pine and fir tribe, require matting to preserve their stems. It may also be observed, that when acacias are killed down to the ground by frost, they

generally send up fresh stems from their roots the following spring: but, on the contrary, trees belonging to the pine and fir tribe, when once killed down to the ground, never spring up again. I may add, as a general rule, that those trees and shrubs which throw up suckers are the easiest to protect; and that plants belonging to the pine and fir tribe, which have no suckers, are the most difficult.

When half-hardy trees and shrubs are nailed against a wall, great care must be taken to preserve them from what gardeners call perpendicular frost; and this is best done by having a moveable thatched or wooden coping projecting about two feet from the wall. Straw, dead leaves, or any other light and dry material, may also be laid over the roots, and a hay-band twisted round the trunk of each tree to about a foot from the ground. It must be remembered that trees against a wall are much more liable to be injured by frost than standards, as it is much more difficult to ripen their wood; and the reason, it is said, is that neither the sun nor the air can get free access to the part of the branch which is next the wall. Trees with thin smooth bark, such as apricot trees, when trained against a south wall, have been observed to suffer more than others; partly because the warmth of the situation makes their sap rise sooner than that of other trees, and consequently they are in a growing state so early as to be in great danger from spring frosts, and partly because after a frosty night they are often exposed to greater heat from the sun in the day.

Herbaceous plants require different treatment to half-hardy trees and shrubs. The stems generally die down to the ground in autumn, but the roots of the more choice and tender kinds are easily protected by covering them with partially decayed leaves. The young shoots, however, in spring are very succulent, and are apt to be affected by damp: hence, though hand glasses are very useful to keep out the perpendicular frosts, they should often be raised a little, or made to open at the top, to prevent any accumulation of moisture or of damp air. Bulbs, when they are left in the ground during winter, should be planted in masses in dry sandy loam, which has been perfectly well drained.

Plant houses.—In the greenhouse, let the lights be opened for a short time every day, when the sun shines, between eleven and three, unless it should be very cold, or there should be a sharp cutting wind. The watering of the plants should be gradually lessened in order to give them a season of repose. A little fire heat

is very useful at this season, but it should only be given when the plants appear suffering from damp, or when a hard frost has set in. Keeping the plants too hot is a mistake that many amateur gardeners fall into, and it is a very injurious one, as greenhouse plants, being natives of climates only a little warmer than our own, are thrown into a state of unhealthy excitement by too much heat, and this excited state is particularly injurious to them when it occurs at a time when they ought to be in a state of complete repose. The conservatory should have rather more heat than the greenhouse, but, unless a frost should set in, a fire once or twice a week will probably be sufficient. Air ought to be admitted during part of every fine day, unless there should be a cold wind; and, at all events, the house ought to be closed up early in the evening, so as to conserve some of the sun heat.

In the *Forcing house* or *pit*, the fire should be kept regularly, so as to maintain the heat at 60° during the night, and 66° during the day. A little air should be admitted every day, and if the weather chances to be mild, air may be admitted freely in the morning, but the house should always be closed before three o'clock in the afternoon. Plenty of water should be given to the growing plants, and poured upon the flues, morning and evening. The plants also ought to be syringed every morning about nine, and again about three in the afternoon. Azaleas and the earliest bulbs and hardy shrubs that force well may now be introduced to this structure, and the Poinsettias and Epiphyllums which are so attractive about Christmas should now be encouraged, and get plenty of tepid water, as they are now in full vigour.

The plants in the cold pit should be examined occasionally, and they should be watered about once a week, care being taken not to suffer the water to fall on the leaves or the centre part of the bulbs, as it will be likely to rot them. When frosty weather sets in, or if there should be a continuance of sleety rains, it is advisable to cover the glass of cold pits with mats, to keep out the cold and wet; and it is generally necessary to cover the glass with mats at night when the air is at all frosty. In some gardens a kind of penthouse formed of a few sticks nailed together, with tarpauling or oil cloth nailed over it, is used for covering bulbs in very wet weather, to prevent the possibility of rain entering, even when air is given. Instead of a framework, a gardener at his leisure hours might paint

or wash over with tar a piece of canvas or coarse linen or calico, which would make a cover to throw over a pit or frame.

The Vinery.—As soon as the leaves have fallen from the vines prune them, take off the loose rough bark, and at the same time thoroughly cleanse the house. They are best pruned in this month, because they are in a state of complete repose. In doing this great care should be taken not to cut too close to the bud; the general rule is to leave half an inch. There are three modes of pruning and training the vine, but that which is considered the best is called the spurring-in system. This consists in training the plant with one long main shoot, and shortening the strongest of the side shoots to one or two buds, removing all the shoots that are weakly, or that grow too closely together, as those left, which are called the spurs, should never be less than twelve inches apart. The borders should be covered over with straw, manure, or dead leaves, in order that the roots may be kept from frost; and if the stems are on the outside of the house, hay-bands should be wrapped round them to protect them also. Some gardeners are so careful of their vine borders, that they thatch them to protect them from excessive wet as well as from frost.

Forcing Seakale, Rhubarb, and Asparagus.—Seakale is usually forced in the following manner. The larger plants are covered with sand, or cinder ashes, and then with blanching pots, which are put over them and pressed firmly into the ground. The intervals between the pots are filled with manure, which is also put over the pots to the depth of six or nine inches. With the stimulus thus applied, the plants will grow rapidly; and the young shoots, pushing in darkness through the sand, will be white and succulent. But by far the handiest and most satisfactory way to force seakale is to take up the roots and place them in some heated place with leaf mould or loose light soil shaken through them. It matters little whether this be in the forcing house or pit, in a hot-bed, or in a trench dug near some warm flue or pipes.

Rhubarb may be forced by being covered with an empty cement cask, or a large tub, and this again covered with manure in the same way as seakale, or it may be taken up and forced like seakale.

Asparagus is forced in two ways, by being taken up and placed in frames, pits, or forcing houses, planted therein on beds with bottom heat, and also by arrangements in the open garden, which

enable the cultivator to force it without destroying the plantations. For very early forcing the best way is to take up the roots as uninjured as possible, and plant them in light mould on a hotbed prepared for the purpose, covering the crown with a depth of five inches of leaf mould or some light soil. It may also be forced in boxes in a forcing pit, or on any surface that may be to spare there. The finest early asparagus is obtained by forcing it where it has been grown, or without disturbing the roots at all. It is best done by having the alleys between the beds excavated three feet or so, and then lined with bricks, leaving "pigeon holes" for the heat of the dung that is to be placed in the trench to pass in more readily. But this is too expensive a mode for many, and as good a way is simply to dig out the trenches between the beds and fill them with warm manure.

Garden Enemies.

Quadrupeds.—Hares and rabbits begin to be very troublesome in this month, and they are particularly injurious to pinks and carnations. Field mice and water rats also again commence their depredations: the former feeding on the newly planted bulbs, tubers, and corms; and the rats feeding on the fleshy stem or rhizome of the water lily, and on the succulent stems and roots of various other water plants.

Birds.—Various kinds of birds feed on berries at this season, particularly the blackbird, the thrush, and the redwing. Unless, however, the berries are wanted for seed, their ravages are of no importance. Those who wish to attract birds could hardly devise a better means of doing so than planting berry-bearing shrubs.

Insects.—Very few insects are visible at this season; but it is advisable to look over the stems and branches of trees for their eggs, and also to search for traces of the coccus insect, many of which will be found at this season on the branches of various kinds of trees. The leaves of trees are often found at this time to have large flies sticking to them, which, though they appear to be alive, are quite dead, and adhere to the leaf by a kind of cottony mildew, but which is, in fact, a peculiar fungus found only on flies. The Rev. L. Jenyns, mentioning this singular fact, adds, that it seems owing to the chill and dampness of an autumnal night coming on

suddenly, as at this season the temperature of the air at sunset, especially if the sky be clear, falls rapidly. The Rev. M. J. Berkeley mentions that this fungus no doubt attacks the fly while living, though it is not fully developed till after death. The reason why it prevails in autumn, he adds, is that the dampness of the air at that season is favourable to the growth of all kinds of mould, and that the suddenness with which flies appear to be attacked with it is merely the rapid growth of the fungus, from the state of the atmosphere.

DECEMBER.

General Observations and Directions.

The Weather, &c.—In December only wintry weather can be expected, and frequently about the middle of the month a hard frost sets in, which continues till the middle of January, or sometimes even much longer. This is the most suitable weather for the season, and certainly the best for the gardener, as it puts a complete stop to vegetation, gives plants what is so needful to them, a season of rest, and hardens the ground so that heavy work may be carried on with greater ease. If, on the contrary, December be moist and open, the plants continue growing feebly, and are so weakened that they seldom recover it all the year. Besides, a mild winter is generally followed by a cold spring, and spring frosts are more fatal to vegetation than any other kind of cold, as they attack the plant when the sap is in motion.

Open Garden.—The chrysanthemums have now passed away, and with their disappearance comes a season of comparative rest. However, there is even now in some places a trace of interest in the flower way. To cull a handful or two of the blossoms of Christmas rose, with any other flowers that bloom at this dull season, and tastefully arrange them to cheer the eye when few think of looking for any floral beauty or interest out of doors, is surely an attractive little duty, especially for ladies. It is surprising how much may be done towards a beautiful vase of flowers by utilizing good blooms of this old favourite, and if greenhouse or forced flowers are not at hand, associating them with bits of berry-bearing shrubs or even ivy leaves. To procure the Christmas rose in the finest possible condition it is desirable to cover a few of the strongest plants with hand lights: under these the flowers will open larger and purer in colour, and be quite clean. It is almost useless to go over old ground again, and say that all planting and alteration

should be finished as soon as possible, and all nailing and the usual winter routine of a garden proceeded with on all favourable occasions. There will be no pressure for some time to come, but careful gardeners are glad to get as much as possible "done before the spring." In the kitchen garden the last earthing up of celery, and the earthing of the first crop peas and beans are about the only cultural operations that need be mentioned. If not done already the root crops should be taken up for the winter's supply. By storing them away in sand or earth in some convenient place under cover, so much disagreeable muddling in wet ground may be prevented as well as time saved.

Indoor Department.—Wherever forcing is carried on, or wherever there are glass houses in good working order, azaleas and camellias, Chinese primulas, early tulips, Roman hyacinths, &c., should be in flower; and the vivid bracts of the scarlet Poinsettia are also now in beauty, so that there is no day in the year on which we may not enjoy floral beauty of some kind. But plants in flower at this season necessarily bear but a small proportion to those not in that state, and our object should be to make the most of those that are in bloom. It is now becoming quite a custom to have flowering plants in the drawing-room, and in some houses in several rooms; but it is not a good system for the plants, as the dry air of living rooms generally hurts them very much, therefore we would advise that plants of any permanent value should not be brought in. Such things as hyacinths and bulbs generally are not of any enduring value like azaleas, heaths, &c., and may therefore be bloomed in the living room as well as in the glass houses. Dwarf things in this way are, besides, much better adapted for drawing-room decoration than taller and more important plants. They are always best arranged in groups, and look very much better when the pots are stood in a pan of some kind, which fits into a vase or sits on a small table, and the whole spread over with some nice green moss. Some moss the pots only; but if the group be closely placed, it is very easy to finish the whole off so that the pots are not seen, and the flowers look as if growing from the moss. In arranging the conservatory or show greenhouse at this season, flowering plants should be placed in good positions, and where they may receive the full benefit of the light and sun. It is of course also necessary that the plants should, as far as possible, be placed where they may be seen to advantage; and a nice effect

may be produced by judiciously placing them here and there among non-flowering plants.

The dark wet days and muggy atmosphere so common at this season are apt to cause mildew and a foggy, disagreeable state of things in the greenhouse or conservatory, and indeed in all cool glass structures. It is most desirable to avoid this if we can; at all events in the greenhouse and conservatory, not only for the prevention of "damping off" among the plants, but also that those houses may be dry and pleasant, instead of moist and disagreeable at this dull season. It can only be done by judiciously giving a little fire heat occasionally, not at night, but in the day, and giving air pretty freely at the same time, so as to prevent any noticeable alteration of the temperature, and of course to thoroughly air and dry the house. An occasional airing of this kind will do much good, but the fire should be put out, or nearly so, at night, unless the weather be very frosty, when of course the temperature of greenhouse and conservatory must be kept up to 40°, or thereabouts. On wet days the amateur will have his vines pruned, if not already done, and the loose bark of the stem rubbed off, to leave as few hiding places for insects as possible; and then coat the stems over with a mixture of sulphur, soft soap, and tobacco juice and water, stirring the whole together, and adding as much clay as will make it of the consistency of thick paint. This will seal up the eggs of vermin, and by thoroughly washing and cleaning every surface in the vinery at the same time, no danger need be feared from insects, provided cleanly and healthful conditions are preserved in the house after vegetation starts in it in spring. The houses containing grapes that we wish to preserve as long as possible should have a good deal of air, and be prevented from getting too damp by an occasional application of fire heat.

Things not to be done in December.

Never use more fire heat in the greenhouse or conservatory than is actually necessary to keep out frost and dry up damps.

Never commence forcing a plant rapidly, but begin all such operations gradually.

Never dig stiff loamy soil when wet.

Never prune or plant shrubs during frosty weather.

Never force seakale in the old-fashioned way by covering it with quantities of manure out of doors, but take up the roots and force them in some close dark place, as elsewhere directed. Both seakale, rhubarb, and chicory may be forced and blanched in covered boxes kept in any warm place—near the kitchen fire will do if no more convenient place may be had.

Never by any chance keep houses at a higher temperature through the night than through the day, but follow nature's rule in the matter, and let it be lower during the night.

Never let the cold air rush directly over tender plants in winter. A very little top air suffices to ventilate the house in harsh weather and drain off any disagreeable moisture.

Never keep pelargoniums far from the glass.

Never let the temperature of any house in which cinerarias are growing descend to freezing point.

Never carry tender flowers through the open air without protecting them.

Never if possible attempt forcing of any kind without a genial and continual moisture in the house, and this is best secured by gently fermenting materials, such as a mixture of leaves and stable manure, or tan.

Never permit any untidiness arising from decayed leaves, &c. in the conservatory to exist at this season.

Principal Operations in December.

Plant Houses.—In the greenhouse fire heat should be applied to keep out the frost, and air should only be given in the middle of the day when the weather is fine. It is, however, very important not to give too much heat at this season, as the plants in the greenhouse should have a season of repose as well as those out of doors, and if they are kept growing all the year they have generally a sickly and unhealthy appearance at a time when they are wanted to be in full vigour and beauty. For this reason it is quite enough if the plants are kept a few degrees above the freezing point, and indeed, the heat of the house should never exceed 40°. Water should also be very sparingly administered, and only enough should be given to keep the plants alive. It is a great point in culture to

keep greenhouse plants in winter as cold and as dry as they can be without injuring them ; in order that they may grow with full vigour when heat and moisture are given freely to them in spring. The reason greenhouse plants, particularly geraniums, are so superior now to what they were a few years ago is, that gardeners have learnt the secret of giving their greenhouse plants a season of rest in winter. Formerly it was supposed necessary to make amends by fire heat for the inclemency of the weather ; and hence greenhouse plants were kept as warm artificially in winter as they are naturally in summer. The same rules apply to the conservatory as to the greenhouse, but more fire heat will be required because, from the great surface of earth exposed, there must naturally be more damp. The greatest heat should generally be given in the morning, and plenty of air should always be allowed at the same time, as it should never be forgotten that the fire is put on, not to warm the plants, but to dry up the damp. The thermometer should never be allowed to stand higher than 45° or 50° during the whole of this month.

The heat in the forcing house or pit should be from 60° to 65° , and the plants should be watered according to their state of growth ; the vigorous ones require a good portion, but those that make little growth will not require much. They should be syringed at noon every fine day. Water should also be poured on the flues or pipes every morning, if the house is not heated by tanks. The vines will require no particular care at this season, except in cases where they are drawn out of the house during the winter, when they ought to be thoroughly protected from frost.

The Cloche.—This is an article quite unknown to the majority of amateurs, but nothing ever introduced to their notice will prove of greater or more varied utility. From the time the cold autumn days set in till genial summer again arrives, the amateur will find abundant use for every cloche he can command, either in salad culture or in protecting single plants, in raising seedlings, striking cuttings, or even keeping in a cleanly and slightly growing state any small subjects like parsley, which we desire to gather in as fresh and unsoiled condition as possible during the winter, when heavy rains are apt to cover low vegetables and herbs with grit and soil ; and in summer they may be used in propagating either bedding or hot-house plants.

It is simply a large and cheap bell glass which is used in every

French garden that I have seen. It is the cloche which enables the French market-gardeners to excel all others in the production of winter and spring salads. Acres of them may be seen round Paris, and private places have them in proportion to their extent, from the small garden of the amateur, with a few dozen or score, to the large one where they require several hundreds or thousands

FIG. 93.



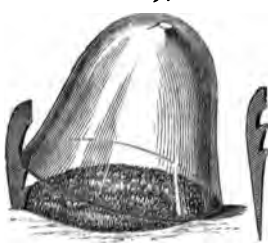
The Cloche as used in Winter Lettuce Culture.

of them. They are about sixteen inches high, and the same in diameter at the base, and cost in France about a franc apiece, or a penny or two less if bought in quantity.

The advantages of cloches are—they never require any repairs; they are easy of carriage when carefully packed; with ordinary care they are seldom broken; they are easily cleaned—a swill in a water tank and a brush-

ing every autumn clears and prepares them for their winter work. They are useful in many ways besides salad growing; for example, in advancing various crops in spring, raising seedlings, and striking

FIG. 94.



The Cloche as used in the raising of seedling plants.

cuttings; and finally, they are very cheap. But of course it is only in market gardens that they would be required in such quantities, and in some small gardens not more than a few dozen will be wanted. Every garden should be furnished with them according to its size; and when we get used to them and learn how very useful they are for many things, from the full developing of a Christmas rose to the forwarding of early crops in spring, they will be much in demand. It is not only in

winter that they are useful, but at all seasons, both in indoor and outdoor propagation and seed sowing. In France seedlings of garden crops likely to be destroyed by birds or insects are frequently raised under the cloche, and the same practice will occasionally be found advantageous in this country.

When not in use the careful cultivator places his cloches in some bye spot, placing them in little piles of half a dozen in each, a

small piece of wood not more than half an inch thick and an inch and a half square being put between each so as to prevent them settling down on each other. Those used to them carry two or three in each hand in conveying them from place to place, and by putting a finger between each. In commencing to use them in our gardens it would be well to see that they were put in some spot where they would not be in danger of breakage. These glasses must not be confounded with the dark and very large bell glasses that were in common use many years ago in our market gardens, and which may yet be seen here and there. These were even dearer than the hand glasses by which they were driven out of use. The French cloche does not cost one-fourth so much as a hand light—does not, like that, require painter, glazier, and plumber for keeping it in repair, and will prove a distinct improvement in every class of garden.

How to procure these cloches has hitherto been the great difficulty. Many have been deterred from employing them by the trouble, expense, and loss consequent on ordering them from France, and I have always despaired of their becoming useful to cultivators generally till they were produced in England at a cheap rate. Even if the carriage was not so heavy as it is, the risk of conveying such very fragile articles across the Channel is such as would prevent us from getting them in a satisfactory way.

I am pleased to announce that Messrs. E. Breffit and Co., proprietors of the Aire and Calder Glass Bottle Company's Works in Yorkshire, well known for its productions, have made preparations for their manufacture on an extensive scale, and will be able to supply them at a rate that will place them within reach of every class of gardeners and amateurs. They propose to sell them at from 10d. to 1s. each, according to the quantities required, and a small addition for package and carriage will put them down in every part of the kingdom. Messrs. Breffit and Co. have offices at 83, Upper Thames-street, E.C.; stores at Free Trade Wharf, Broad-street, Ratcliffe, E., 120, Duke-street, Liverpool, the seat of manufacture being at Castleford, near Normanton, Yorkshire. At any of the addresses orders will be taken and executed as soon as possible. It is fortunate that their manufacture has been taken up by a firm with every means of carrying it on in the best manner, and with stores in the north and in Liverpool, as well as in London.

The cloche is sometimes made with a knob; but with a knob it is not so easily packed; and in France they are rarely or never used with knobs.

Christmas Plants and Flowers.—The custom of associating living plant ornament with Christmas festivities is one that was begun so long before any of the exotic and showier types of vegetation were seen in these climes, that there is no necessity to urge the great abundance of choice plants now within our reach as a reason for exercise of some taste and pains in making our homes gay and graceful with plants during the shortest days of the year. In the old time they had what we may term a strictly Gothic selection—the armed coral-berried holly; that best of all climbing evergreens, the common ivy; and the quaint, and to northern minds very singular, mistletoe, the only conspicuous parasite of our regions. It was but a trio, but one not easy to beat. If our Christmas decorations be as much in advance of the old ones as they ought to be, they will be very attractive indeed.

Now perhaps, of all the plants and flowers of the period, the best are those somewhat akin to the long-used holly and ivy. We should prefer the deep perpetual verdure and the cheerful berries of *Cotoneasters*, *Skimmias*, *Hollies* in variety, *Aucubas*, which have lately begun to berry very handsomely in our gardens, *Crataegus*, *Pyracantha*, and any other bright berry-bearing shrubs. These are so particularly useful that it is an excellent plan to grow them healthfully in pots, so that they may be removed and grouped anywhere without injury, and be also kept dwarf and neat. Of course the coral-garnished spray of such plants may be tastefully used in wreaths, dishes of fruit, and amongst cut flowers; but a far higher use might be made of groups in pots, not only occasionally in the house, but plunged in beds in the open air near it, and even used in boxes on the outer sides of the windows. We have seen most chaste and attractive boxes of this kind filled thus. These of course may be kept growing, plunged in some by-nook in summer; and even at that season they will be found occasionally useful. In addition to those used for their berries alone, we need scarcely add there are many which deserve attention from their lustrous health and verdure in winter, and which are peculiarly fitted for associating with those we have just named—the *Minorca* and other *Boxes*, the *Laurustinus*, *Berberis Darwini*, and many Japanese shrubs and dwarf conifers introduced of late years, including a group of nicely se-

lected silver Hollies, which are very effective by gaslight. One shrub we should never fail to be without in pots or tubs, and that is the *Laurustinus*. The warmth and protection of a conservatory or cool glass house at this season induces it to bloom as vigorously and sweetly as a May flower. Wherever standard evergreens are grown in tubs for placing out of doors on the terraces, &c., in summer, this should be grown as a standard, as it may be enjoyed in winter for its flowers, and in summer for its foliage alone, like bays and other plants grown as standards; but it is well worth growing for its winter uses alone. In cutting from shrubberies or groups for indoor embellishment at this season, to the above the *Arbutus*, the *Euonymus europæus*—‘the fruit’

Which in our winter woodlands looks a flower—

may be added; nearly all evergreen.

It may be worth noticing that some evergreens, like laurels, &c., may prove highly effective in church decoration or the like, and yet be rather coarse and out of place in rooms, and especially small rooms. To the plants used in pots for the sake of their berries might be added a few tender subjects from the ‘houses,’ notably the *Solanum capsicastrum* and *Pseudo-capsicum*, the *Ardisias*, *Rivinia humilis*, and dwarf oranges where they are grown well in small pots. We need hardly say that groups of the most charming character may be formed of the hardy plants above mentioned, with the symmetrical and elegant little dwarf pines and neat evergreens; and as the greater number may be grown almost anywhere, we give them the precedence.

Of the flowering plants of the season we know of none to equal the varieties of *Epiphyllum truncatum* for beauty of colour or abundance of bloom. The plant is very extensively grown for room decoration in Paris, and well appreciated by intelligent gardeners who require a supply of winter flowers, and should be grown by everybody who is in possession of any warm garden structure. To be of any real value they must not be grown on their own roots, but on those of an entirely different plant—*Periskeia*. They grow about as much in one year on this stock as they do in six on their own roots—a fact curious enough in its way. By no means so easily grown is the very popular *Poinsettia pulcherrima*, yet so abundantly furnished to Covent Garden by market gardeners, who have

the knack of growing it to perfection in a dwarf state, that it is far more often seen than the *Epiphyllums*. Besides, they are rarely seen in nice condition till several years old. The *Poinsettia* may be well done in one; nevertheless, it requires the skill of a plantsman to bring it to perfection, while we have seen the *Epiphyllums* go for years without potting, and we know they will bloom abundantly under the rudest cultivation in the warm vinery, or what is called an intermediate house. Anybody commencing their culture would find that, instead of the 'dry' treatment usually given to cactuses suiting them, they would flourish in the most luxuriant way on a mild hotbed, in a pit or frame, during the spring or summer months. The popular Persian cyclamen is, where well grown, perhaps the most valuable of dwarf flowers at this season. Its leathery and smooth leaves enable it to stand a degree of dryness and dust in rooms that most other things would quickly fade under. Winter-flowering carnations are particularly useful for cutting from, or for using in pots; they too do not suffer quickly from a little dryness. Those who have planted the noble *Lapageria* in their greenhouses or conservatories, will now most probably be able to cut a few of its massive and showy tubes for indoor decoration. *Thysacanthus rutilans*, *Ipomœa Horsfalliæ*, bright-leaved *Dracœnas*, sundry *Orchids*—among others, *Lælia albida*, *Oncidium pulchellum*, *Calanthes* in variety, *Odontoglossum Cervantesi*, *Lycaste Skinneri*, one of the finest of orchids, which flowers for a long time in the drawing-room without protection, and the *Cypripediums*, of which the old *insignis* also blooms a long time, are perfectly at home in a drawing-room. Doubtless the same may be said of many other orchids, when they are sufficiently plentiful to be extensively tried in this way. Of *Heaths*, *hiemalis*, *elegans*, *melanthera*, *scabriuscula*, and *colorans* are about the best for Christmas; and of the *Epacrises*, *Vesta*, the *Bride*, *Alba odorata*, and *variegata*.

One bulb, as yet far from common, is so peculiarly suited for the most exquisite groups of Christmas flowers, that we hesitate not to make a special pleading for it. It grows about a foot high, and suspends flowers of a peculiarly rich yellow tipped with green. The coloration is so distinct that the plant would be attractive, no matter how the flowers were attached; but when it is said that they droop more gracefully from their slender footstalk than the snowdrop, those who do not know the plant will have some idea of the singular attractiveness of *Urceolina aurea*. Finally, passing by the

Chinese Primulas, Mignonette, late Chrysanthemums, and sweet Indian Daphne, we conclude with one of the most valuable of winter bloomers ever introduced to this country—*Luculia gratisima*, a native of Nepaul, just the country worthy of it. With large simple leaves somewhat like those of a *Hydrangea*, and bunches of rosy flowers 6 in. or 7 in. across when well grown, and a delicious fragrance, it requires no deep perception to recognise its claims when once seen; but the opportunity to see it does not occur every day. This arises from the fact of its being one of those plants that in pots are only seen in perfection with a really good 'plantsman.' Being a vigorous subject, it requires to be planted out in the bed of a warm conservatory, or some house the winter temperature of which is somewhat higher than the greenhouse, and there, with a mere tithe of the trouble it requires in pots, it will give perennial satisfaction. There is a plant of it treated thus in one of the glass houses in the Royal Gardens at Frogmore, and from it every year are cut about 100 trusses for Christmas decoration, for which purpose they are certainly the best, and at present among the rarest of the time.—*Field*.

Table Decorations.—The graceful practice of adorning the dinner table with plants and flowers has become very prevalent of late years, and the following remarks from the *Gardener's Chronicle* cannot fail to point out what to avoid to those interested in the subject at this festive season :—

"There can be little doubt that a very large majority of table decorators regard their occupation as the art of grouping the greatest possible quantity of fruit and flowers in the most showy manner. We presume to differ with them on this matter, and to regard table decorations as worthy of being treated as a branch of the fine arts. If eating and drinking were the sole objects of a dinner-party it is obvious that the presence of flowers would be superfluous. But inasmuch as the real object is social enjoyment, it becomes imperative that nothing should in any way interfere with conversation or be offensive to the eye or nose. Now, obstruction to view, and consequent interference with conversation between any two persons sitting at a table are among the most frequent of what we venture to call offences against good taste. On a recent occasion we were entertained most luxuriously by a wealthy neighbour. It was a party of fourteen, all pleasant people; the table was a long one, bearing in its centre a massive epergne, raised upon a stand and

crowned with a very heavy basin of very heavy flowers. On either side of this centre-piece were two very handsome silver wine-coolers, each containing a grand plant of *Adiantum cuneatum* in a No. 16 flowerpot. Two better grown plants were not often seen, and very proud of them was their worthy owner. But little did he think of the annoyance which they and the epergne were inflicting upon his friends, for while he from his presidential chair could see and converse with every one but his better half, without swaying either to the right or to the left, his guests were literally divided into two dinner parties by a wall of solid silver. We confess to our chagrin at seeing a charming creature taking her seat opposite to ours and disappearing from view for a couple of hours, 'though lost to sight, to memory dear;' and we leave our readers to conceive the amount of satisfaction with which we heard the merry laugh and repartee of our 'superior moiety,' without being able to see with whom she was conversing.

"With but few exceptions there should never be in our judgment anything to interrupt a view across a dinner table. The line of sight may be said to range from the height of fifteen inches to twenty inches above the table. Low dishes or stands of fruit or flowers should therefore never exceed fifteen inches in height, while masses and other tall ornaments should have slender stems, and none of their contents should droop or hang over to a lower point than twenty inches from the table. The line of sight will thus be free, and the general conversation uninterrupted—by inanimate subjects at least.

"In thus dictatorially laying down the law for the implicit preservation of the line of sight we would not be misunderstood by its being supposed that we should approve of any arrangement which would render these lines of height—viz., 15 in. and 20 in. from the table—markedly noticeable. As little should we speak approvingly of the head of hair which had been cut with the aid of an inverted slop basin. While this space must be left open, it is both unnecessary and undesirable that its margins should be observable, and further it is a relief to the eye, without causing any obstruction to the view, that this open space should here and there be varied by delicate climbers drooping from the taller vases. For this purpose we know of nothing so lovely as the young branches of the climbing fern *Lygodium scandens*; next to which come the *Selaginellæ*, *Cissus discolor*, Virginian creeper, and similar graceful foliage. In

the same way the stringent regulations laid down enforcing the preservation of the lower line of 15 in., may be agreeably relaxed to the extent of an occasional peeping up of a spike or blade of grass or a spray of *Gleichenia*, or some other elegant and delicate fern. In short, the range of sight may be intersected by fine stems and delicate foliage to any extent short of interruption or confusion of view.

“When cut flowers only are used for table decoration, and as a rule they are more easily obtained by the amateur, and produce at least as good effects as the best grown plants, it will be well to bear in mind the principles which should always regulate the arrangement of cut flowers. Of all the various mistakes which are made by persons in arranging flowers, the commonest is that of putting too many into a vase; and next to that is the mistake of putting too great a variety of colours into one bouquet. Every flower in a group should be clearly distinguishable and determinable without pulling the nosegay to pieces; the calyx of a clove pink should never be hid by being plunged into a head of white phlox, however well the two colours may look together. Sweet peas never look so well in the hand as they do on the boughs over which they climb, because they cannot be carried without crowding them; but put them lightly into a vase with an equal number of pieces of mignonette, or rather ornament a vase half full of mignonette with a few blooms of sweet peas, and you get a charming effect, because you follow the natural arrangement by avoiding crowding of the blooms, and putting them with the green foliage which they want to set them off. Few people are aware until they try it how exceedingly easy it is to spoil such a pleasing combination as this; a piece of *calceolaria*, scarlet geranium, or blue *salvia* would ruin it effectually. Such decided colours as these require to be grouped in another vase, and should not even be placed on the same table with the sweet peas; they also require a much larger preponderance of foliage to show them off to advantage than is wanted by flowers of more delicate colours. There is no kind of foliage so generally useful for all purposes of decoration as that of ferns; and next to these must be ranked the smaller kinds of the fir tribe, such as *arbor vitæ*, yew, cypress, and juniper. In the selection of these for use amongst flowers there is great scope for taste and judgment. The stiff-growing ferns, such as *blechnum* and *osmunda*, and the branches of *thuja* and *taxus* go best with spikes of tall flowers. More deli-

cate flowers are better set off by elegant and finely divided species of pteris and davallia, and by pieces of juniper and cypress; while the climbing ferns and selaginellas come in where scarcely anything else can be used, and give a charming and tasty finish."

Garden Enemies.

Insects.—The December moth is found at this season sticking against the trunks of trees in apparently a half torpid state. The caterpillars of this moth are greyish, with a darker line down the back, and four red spots on each segment. They feed generally on the leaves of fruit trees, and they spin themselves a web, under the protection of which a number of them live together, coming out to feed. The herald moth is also occasionally seen at this season, and it is so torpid that it will suffer itself to be taken in the hand without making any effort to escape. Even when a finger is put near it, it only moves its head and antennæ a little without attempting to fly away. A moth of this species was observed by the Rev. Leonard Jenyns to remain in a torpid state above seven months. In the beginning of December the leaves of the ivy and other evergreens will be sometimes found with dead flies sticking to them in the same way as mentioned in November. The tortoiseshell and peacock butterflies are often seen in a half-torpid state at this season, and as it is found that the butterflies which survive the winter do not lay their eggs till the spring, it may be safely presumed that killing a butterfly at this season will save the garden from the ravages of a brood of caterpillars. Search should now be made for the nests of wasps, as they are often found to contain perfect insects, though in a torpid state from the cold, and every wasp that can be killed in winter or spring will prevent a nest being formed in the summer.

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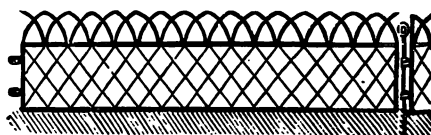
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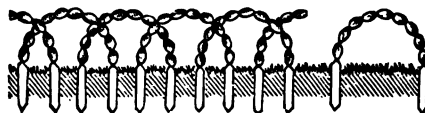


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